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COMPARATIVE SURGERY.

THIRD SERIES OF REPORTS.

By J. T. Geraghty; J. W. Churchman; S. J. Crowe; F. F. Gundrum; C. W. Mills; R. D. McClure and H. F. Derge; C. H. Bryant; H. M. Evans and A. G. Brenizer.

(From the Hunterian Laboratory of Experimental Medicine.)

Numerous requests for further data in regard to the methods of teaching operative surgery in the Hunterian Laboratory have come from various parts of the country where similar courses are being formulated or have already been introduced into the curriculum. I shall take this opportunity of replying to some of these inquiries.

The three main purposes for which the laboratory was established are: (1) investigation, particularly along the lines of morbid physiology and comparative pathology; (2) the treatment of the surgical maladies common among the smaller domesticated animals; and (3) the training of third year students in such fundamental principles of actual surgical handicraft as anæsthesia, asepsis, hæmostasis, and the proper handling of living tissues and organs. In the accomplishment of these objects considerable overlap is possible; thus, for example, the strictly veterinary work gives opportunities for the instruction of junior students in modern surgical methods and furnishes at the same time abundant occasion for investigation—opportunities exactly comparable to those offered by the conditions of disease encountered in a hospital for human beings.

We are often asked what attitude is held by the local veterinarians toward our seeming encroachment on their particular field of work; and it may be said that we have received encouragement and friendly co-operation from many of these gentlemen. Most men engaged in veterinary work find it difficult or impossible to secure sufficient training in modern methods of aseptic surgery to enable them to carry out with a minimum of risk—not to mention the minimum of suffering—even the simpler operations such as spaying, the radical cure of hernia and of vaginal prolapse, the removal of superficial tumors and the like.

It is remarkable that the surgical maladies of our domesticated pets continue to be treated in ways which are exactly comparable to the crude and painful procedures to which human beings were necessarily subjected in the dreadful days before anæsthesia and before Lister—days when operations were largely limited to lesions external to the body cavities, when escharotics were used, the actual cautery, crushing clamps and similar harsh measures. There can be no better illustration to-day of the strides in surgical technique which the last fifty years have seen than the comparison of a clean, painless ovariotomy as performed by a skilled surgeon and the corresponding operation on a dog by an untrained veterinarian—in the latter case a struggling animal suspended by her hind legs; often no anæsthesia or skin preparation; a bilateral opening through which the ovary on each side is withdrawn by an unclean finger introduced into the peritoneal cavity, to be

subsequently avulsed from its attachment without other effort at hæmostasis. On the one hand, experience gained almost entirely from animal experimentation is used constantly for the benefit of mankind; but on the other the animals whose kin have been sacrificed to supply this experience have as yet profited nothing thereby.

I do not mean that such measures as this are invariable with veterinarians, for there are doubtless notable exceptions among the graduates from the better schools in other cities as there are here in Baltimore; but from what we have seen of the end results of surgery as it is generally practiced upon the lower animals it is safe to say that these methods represent those commonly utilized. It is not because veterinarians are heartless—surgeons in times gone by, by force of necessity employed similar procedures; it is because the majority of them have had no opportunity to learn other and more humane methods of treatment. After attending some of our surgical exercises as onlookers a number of these men have begun to send their more serious surgical problems for us to solve; and we anticipate, furthermore, in the coming graduate course in the spring, to have a table set aside for their use, so that a selected few who are desirous of acquiring experience in modern aseptic methods may do so free of expense. It is purposed also to extend the privilege to a number of these men of operating on their own patients in the laboratory; in this way we shall doubtless see a larger number of the serious maladies at present regarded by most veterinarians as surgically incurable, and we shall acquire at the same time more pathological material for comparative study—a mutual benefit. It means, perhaps, the beginning here of veterinary work under university auspices, and we feel that, by enrolling the interest of the men already engaged on this work, we can be of service not only to them, but indirectly can spare much suffering on the part of the lower animals.

Although during the past school year we were under no direct affiliation with the veterinarians, nevertheless an increasing number of animals suffering from surgical maladies have been referred to us, and there have been admitted to the laboratory-clinic instances of the following conditions. There has been an unusual variety of neoplasms. In addition to a number of the mixed tumors of superficial glandular origin, such as were described by Dr. Ortschild in his paper two years ago, we have seen a primary osteosarcoma of the radius; epitheliomas on the thoracic wall and neck; a primary melanotic sarcoma of the scrotum; a case of multiple fibromata of the vaginal wall; a malignant papilloma of the kidney; a primary sarcoma of the heart; a mammary cancer in a cat, etc.[1] There have been a number of cases of fracture, simple and compound, of the extremities and of the skull; cases of "cancrum oris;" a suppurative infection of the frontal sinus; strangulated hernia; cases of spinal paraplegia, both following trauma and secondary to distemper; a second case of chronic endocarditis with bloody ascites; a number of opthalmological conditions necessitating enucleation or cataract operations, and so on. In addition several animals have been sent to us to be spayed.

These patients with pathological lesions, together with the animals evidently suffering from fatal maladies which are brought to us from time to time by their owners to be humanely sacrificed, have supplied us with considerable material for surgical work, but as yet the number of admissions derived from these two sources has proved insufficient for the necessary amount of class material—this is partly due to the fact that many of the patients are valuable dogs whose ailments are much too critical to be turned over to students who as yet may be surgical novices.

Consequently we have been compelled to use for surgical teaching—the operations being carried out with all respect for modern surgical precautions—certain vagrant animals suffering from no other maladies than the minor ills which affect the entire stray canine population; and animals from this source are likewise used for experimentation, the results of which should indirectly prove of benefit not only to those domestic animals more fitted to live, but, in many cases, from a comparative point of view, even to human beings.

It is this aspect of the work concerning which we are most frequently consulted, and at the present day I should not feel justified in advising the inauguration of a purely operative course in any medical institution apart from the associated veterinary work, even though the training is of the greatest possible value to students. I doubt not that the time will come when intelligent legislation will provide for the needs of medical schools in supplying such lower animals as are necessary for research and teaching, just as it has already done in regard to anatomical material. It was absolutely essential to have bodies for dissection, and until suitable laws were passed and an Anatomical Board was established abuses were flagrant; it is equally essential to employ living animals for the furtherance of our knowledge of disease and its methods of treatment, but as yet there are no laws which recognize this fact. The natural solution of the difficulty would be to have the vagrant animals, which are at present gathered in at the city's expense and sacrificed at the pound, turned over, if unclaimed, to, let us say, a Board of Veterinarians for use in proper ways in the veterinary and medical schools, and I doubt not but that the matter will at some future time be decided in this way.

For the present we must continue to use stray animals of the class that otherwise find their way to the city pound, and these animals as a rule are easily distinguished from those which have homes.

Personally I cannot but think that an ultimate death under anæsthesia in a laboratory-hospital, where in the interval of sojourn painstaking care for the health and wellbeing of the

[1] Fragments from many of these tumors have been transplanted into vagrant animals in the laboratory without any subsequent growth from the grafts; we have encountered none of the cases of lymphosarcoma which afford so favorable an opportunity for the study of malignant disease by transplantation. It is quite possible that had it been feasible to graft tissues into a larger number of animals—rarely more than four were used on each occasion—we might have succeeded in starting a successful series of transferences.

inmates is, if for no other reason, necessary for the success of operative measures, must be a less tragic death than the usual one from violence, disease or starvation, to which most of these animals ultimately succumb on the streets.

Certainly no one should enter upon such work without being fully alive to its moral responsibilities and fully informed in regard to the arguments advanced, doubtless always with benevolent intent, by those who abhor for any purpose whatsoever experimentation upon animals. No student should be allowed or should allow himself to undertake researches involving the life of animals, any more than he should allow himself or be allowed to shoot game for sport—even for food or wearing apparel—unless the right of the action has been clearly settled by competent authority, and he feels that the end in view justifies the sacrifice of animal life. Particularly from the standpoint of vivisection this matter has always been carefully laid before each group of students, and they are urged to read such volumes on the subject as have been published by Stephen Paget,[2] Harold C. Ernst;[3] the minutes of evidence before the earlier commission as well as those taken before the Royal Commission on Vivisection,[4] which more recently has been sitting in London; and the report of the hearing before the Senate Committee, in February, 1900, in Washington.[5]

Contrary to the common view that an experimentalist becomes callous to animal suffering, I think the reverse is true and that no one holds in abhorrence the infliction of unnecessary pain upon animals more than do those who live in a laboratory, surrounded by them. It may not be out of place to append here our laboratory rules:

1. Animals admitted to the laboratory, whether as vagrants or as veterinary patients, shall receive all possible consideration for their bodily comforts and their surroundings shall be kept in the best possible sanitary condition.

2. In all operative work conducted in the laboratory the same aseptic precautions shall be taken and the same efforts made to avoid the infliction of any pain by the proper use of anæsthesia that are observed in a hospital for human beings.

3. No operations or experimental investigations shall be undertaken except with the sanction of one of the directors of the laboratory, who shall hold himself responsible for the fact that the procedure is justified by the end in view and that it is performed in such a manner as to minimize all discomforts, particularly in those cases in which the animal is allowed to recover from the anæsthetic.

4. Records shall invariably be kept in regard to all operative or experimental investigations and these records, as well as all pathological material, shall remain the property of the laboratory.

5. No animal, whether a patient or the subject of an investigation, when afflicted with an incurable or lingering illness, shall be kept alive, unless at the solicitation of the owner, in whose absence judgment in the matter shall rest with either of the directors of the laboratory.

6. An autopsy shall be performed in all cases of death occurring in the laboratory, and these autopsies shall be conducted with the same respect and formality observed in the pathological department of a general hospital, and the findings shall be recorded in the laboratory records.

7. Vagrant animals brought to the laboratory and purchased there shall be held as at the city pound for at least forty-eight hours, and shall be returned to their owners if claimed and identified.

We have learned from some other places, where the effort has been made to establish courses similar to those given in the Hunterian Laboratory, that some local opposition has been aroused among those who have little sympathy with biological or surgical advancement at the expense of animal life; but I feel sure that with precautions such as we have taken to remove the objectionable feature from the work and with the demonstration that it is for the actual benefit of the fittest to survive of the class of animals that are used, there will be no occasion whatsoever for criticism.

I have felt that it is especially needful for the graduates who take the operative course during the spring months—many of whom after their return home endeavor to keep themselves surgically expert by occasional operations upon animals—to carry out this work openly and in such a way that there can be no occasion for unreasonable opposition. Their townspeople can be easily made to understand the wisdom of a demonstration that they can safely conduct operations upon animals before undertaking similar procedures upon man—and many a physician in a small community, by force of circumstances, must in emergency not infrequently carry out more or less major operations.

During the past year all told, a large number of animals, chiefly dogs, cats and rabbits, have passed through our hands at the Hunterian Laboratory, which has come to be a distributing centre for the other laboratories of the school where, from time to time, experimental observations must needs be made. Inasmuch as when housed under one roof and cared for by trained attendants much better accommodations are assured than if an attempt were made in separate departments to have small animal-houses, by this arrangement not only do the inmates receive better attention and are kept in better health, but also, owing to methods of overlap, there is an actual saving of animal life, since the surgical procedures are much more likely to be conducted without fatalities in an operating room where modern surgical methods are in constant use than in laboratories where there may be a less strict technique. In this way it is often possible to utilize, for purposes of surgical teaching, such procedures as the making of fistulæ, the extirpation of organs and the like, when animals with these lesions are needed for demonstration or research in the physiological laboratory.

[2] Stephen Paget: Experiments upon Animals, with an Introduction by Lord Lister. G. P. Putnam's Sons, New York, New Edition, 1903.

[3] Harold C. Ernst: Animal Experimentation; A Series of Studies Indicating its Value to Biological and Medical Sciences. Little, Brown & Company, Boston, 1902.

[4] Royal Commission on Vivisection. First, Second, and Third Reports of the Commissioners. Minutes of Evidence. London, 1907. Wyman & Sons, Ltd.

[5] Hearing before the Senate Committee of the District of Columbia, Feb'y 21, 1900, on S. 34, for Future Prevention of Cruelty to Animals in the District of Columbia. Senate Document 26, 56-1, serial 3868.

The course of twenty exercises given for advanced students or for graduates is somewhat as follows; the methods used in presenting the subjects for the individual exercises have been described in another article:*

1. General surgical principles and conduct of operations; preparation of material, of gauze, sutures, etc.; asepsis and antisepsis; simple median abdominal exploration for the removal from the stomach of a foreign body previously inserted. *Gastrotomy.*

2. Variety of abdominal incisions and methods of closure. Removal of cæcum through an intermuscular (gridiron) incision. *Appendectomy.*

3. Surgery of the kidneys, with methods of exposure and exploration of these organs. *Nephrotomy* and *Nephrorrhaphy.*

4. Physiology of the gastric secretion, with review of Pawlow's, Cannon's and others' work. Development of the operation of *Gastrostomy.*

5. Physiology of the duodenal secretion. Surgery of the pancreas and biliary passages. *Cholecystectomy.* Exposure of pancreatic ducts by transduodenal incision. Pawlow's pancreatic fistula for more advanced students.

6, 7, 8. The development of the operation of *Gastroenterostomy.* (1) Simple anterior method with lateral anastomosis and its deficiency, as seen from subsequent results. (2) The posterior operation by a short-loop or no-loop method. (3) Roux' "Y" gastroenterostomy.

9. Non-malignant pyloric stenosis. Gastric ulcer; its course and methods of treatment in various stages. *Pyloroplasty.*

10. The various methods of *Herniotomy.*

11, 12. The general technique and principles of amputations by slow methods of dissection with complete hæmostasis. (1) *Amputation at the hip.* (2) *Interscapulo-thoracic amputation.*

13. Malignant disease of the stomach. *Pylorectomy.*

14, 15. Intestinal resections and the various methods of anastomosis. The physiology of intestinal digestion. Segmentation and peristalsis. (1) *Lateral entero-enterostomy.* (2) *End-to-end entero-enterostomy.*

16. The physiology of the large intestine; its surgical lesions and their operations. *Resection of cæcum.*

17. Surgery of the chest, heart, and blood-vessels. Principles of intrathoracic work; artificial respiration, etc. *Resection of rib. Thoracotomy. Anastomosis of blood-vessels.*

18. The general principles and technique of spinal operations. The physiology of spinal lesions, etc. *Laminectomy.*

19. Technique of cranial operations. Cerebral localization. *Craniotomy;* with cortical stimulation.

20. Gun-shot wounds of the chest and abdomen.

A course of exercises such as this can be indefinitely prolonged and variously modified. When conducted, however, not for the purpose of teaching any particular operative procedures, but rather for the purpose of enabling the student to acquire technical facility in exposing and handling the different living tissues and organs, and experience with the healing of wounds, such a course should suffice to firmly establish the necessary surgical resources which not only make of him a safe assistant, but which will enable him to undertake with comparative safety the treatment of almost any minor surgical ailment, and at the same time will give him a very good chance of successfully carrying through such major operations as he may in emergency unavoidably be called upon to perform.

HARVEY CUSHING,
J. F. ORTSCHILD.

* Instruction in Operative Medicine: with the Description of a Course given in the Hunterian Laboratory of Experimental Medicine. Johns Hopkins Hospital Bulletin, 1906, Vol. XVII, p. 123.

XII. BALANO-POSTHITIS IN DOGS.

By J. T. GERAGHTY, M. D.

It has been noted for some time that 75 to 80 per cent of the male dogs brought to the Hunterian Laboratory have what was supposed to be a urethral discharge. It has been a prevalent lay opinion that this discharge in dogs is similar in nature to the gonorrhœal urethritis of man, but whether this view is generally held by veterinarians we have been unable to learn.

It is well known that prostatic hypertrophy in dogs is not a rare condition, and the fact that they, in common with man, are supposed to be frequent sufferers from urethritis, has been used as an argument in favor of the inflammatory nature of prostatic hypertrophy. Hence the investigation of this subject was of interest from the standpoint of comparative pathology.

On examining the afflicted dogs a rather thick, greenish-yellow discharge is seen to ooze from the preputial orifice. On retracting the prepuce the glans is found bathed in this thick secretion, but none can be milked or squeezed from the urethra. The mucous membrane of the prepuce and the glans presents no macroscopic evidence of inflammation and to all appearances seems entirely normal. There is no redness, erosion or œdema of the tissues, while the surface epithelium appears to be intact.

Smears made from the discharge show a few pus cells and an enormous number of bacteria. The prevailing type of organism is a short, slender bacillus, although a variety of cocci and bacilli of other forms are present.

In order to determine more definitely the character of the infection and to exclude if possible the presence of an infection of the urethral mucous membrane, blocks of tissue were taken from the prepuce, glans and urethra.

Prepuce.—Sections made from its inner or mucous surface show an intact epithelium which appears to be normal in every respect. Between the epithelial cells, however, numerous polymorphonuclear leucocytes are seen, and beneath the epithelium there is evidence of an inflammatory reaction; for we find a considerable infiltration of round cells and leucocytes, though

there is very little if any fibrous tissue formation. Beneath the epithelium also numerous lymphoid follicles are found. The inflammatory reaction often surrounds these follicles but does not invade the lymphoid tissue itself. The inflammatory process does not extend deeply into the subepithelial tissue and appears to be a very low grade of infection.

Glans.—Examination of the sections from the glans shows a somewhat different picture from that noted in the prepuce. The epithelium is intact and apparently normal, aside from the fact that occasional leucocytes are seen lying here and there between the epithelial cells. There is, however, no subepithelial inflammation as seen in the prepuce, the leucocytes having apparently wandered in from the surface.

Urethra.—Numerous sections were made from different parts of the urethra, penile, membranous and prostatic, and in every instance the mucous membrane was entirely normal, there being no evidence of any inflammatory reaction whatsoever.

These observations seem to demonstrate that the penile discharges so common in dogs and generally considered to be due to a urethritis are, on the contrary, due to a mild grade of balano-posthitis.

XIII. PROSTATIC HYPERTROPHY AND PROSTATIC ATROPHY IN THE DOG.

By J. W. CHURCHMAN, M. D.

An examination of the rather meager literature on prostatic hypertrophy in the dog shows that the condition, though well recognized, has received scant attention in its histological aspects. Marked variations in the size of the dog's prostate are mentioned as frequent by Ellenberger and Baum; and Kitt refers to prostatic hypertrophy, both adenomatous and fibrous, as of common occurrence in old dogs. Neither writer, however, pays much attention to the microscopical picture, though Kitt refers to the frequency of prostatitis in dogs—both catarrhal and purulent—and to its presence in the hypertrophied prostate. It is an interesting fact that suprapubic prostatectomy had been done by a German veterinarian (cited by Loumeau) on ten dogs, for prostatic hypertrophy, before the operation, commonly known as Freyer's operation, had been done on man.

The normal prostate of the dog.—The dog's normal prostate (Fig. 1*C* and Fig. 2) is composed of numerous lobules seen to be sharply separated, when examined microscopically, by fibrous tissue trabeculæ. The striking feature about the gland is the richness of its acinous labyrinth; the picture seen in human hypertrophy is suggested, except that the acini are not dilated and are lined by normal epithelium. The richness in glandular tissue is, however, in marked contrast to the normal human gland. The epithelium lining the acini is of the high columnar type.

Another striking feature often seen in the prostate of the dog is the infiltration of the interacinous connective tissue with round mononuclear cells. I am not sure just how frequent this condition is, but there is no doubt that it very often occurs. A few polymorphonuclear leucocytes also take part in the invasion; but the majority of the cells are mononuclear and vary in size—the smaller cells having heavily stained granular nuclei, the larger, faintly stained nuclei with one or more nucleoli. Lymphoid prostatis, in other words, is apparently a frequent finding in the "normal" prostate of the dog.

Prostatic hypertrophy in the dog.—The specimen of hypertrophy described in this communication was obtained at autopsy on a vagrant dog which had been sacrificed under ether owing to his poor condition. The animal was a large, shaggy dog of unknown age. For the twenty-four hours after his admission and up to the time of his anæsthetization he moaned and cried incessantly. This fact I was at first tempted to explain as a symptom of urinary retention due to the prostatic hypertrophy actually found at autopsy; but subsequent study of the specimen showed such an explanation to be unwarrantable. No other facts in the previous history of the animal are at hand. The specimen removed consisted of prostate, bladder, ureters and vasa deferentia. The kidneys were macroscopically normal.

The *prostate* (Fig. 1*B*) was large, nearly round, symmetrical, quite regular in contour and with a definite median groove. It measured 5 x 4.5 x 3.5 cm., and was much larger than the bladder, which measured 3.5 x 4.5 x 2 cm. The neck of the urethra commonly seen in the dog between the bladder and prostate was encroached upon by the prostatic hypertrophy. The gland was soft and homogeneous. There was no lobulation nor anything to suggest the spheroids of human hypertrophy. On section of the hardened gland, the cut surface showed the same picture throughout and there was no differentiation between central and peripheral portions. The surface was smooth and homogeneous except that it was dotted throughout with dilated ducts varying in size from small cysts just visible to the naked eye to larger ones nearly 1 mm. across. The appearance suggested fibrous tissue rather than a tissue rich in cells—in contrast to the appearance of the cut section of a normal prostate, which is quite cellular. The prostatic urethra was large, patulous and normal in shape. The prostatic orifice was normal and its mucosa was continuous with that of the trigone without the suggestion of a *bas-fond*.

On microscopical examination the notable feature was not an increase in the number of acini—which in the normal dog's prostate are as numerous as possible—but a dilatation of the acini. This was quite marked in some portions and very

slight in others; so that in one field one could find normal acini lined by high columnar epithelium (Fig. 3), in others slightly dilated acini lined by low columnar epithelium (Fig. 4), and in others still, large cystic acini lined by flat epithelium (Fig. 5). It was the cystic dilation of the acini which stamped the lesion as true hypertrophy (cf. with Fig. 6 a microphotograph of a section of prostatic hypertrophy in man). There was very marked cellular infiltration of the connective tissue (Fig. 3). Many of these cells were mononuclear, but a few were polymorphonuclear leucocytes. No corpora amylacea were seen.

The *bladder* had a definitely but not markedly thickened wall; otherwise it was quite normal. Trabeculation and *bas-fond* formation were conspicuously absent. The ureters were normal. These characteristics, together with the normally shaped prostatic urethra, made it certain that the hypertrophy in this dog caused no urinary obstruction.

Remarks on the etiology of prostatic hypertrophy.—It is interesting to inquire whether the study of prostatic hypertrophy in dogs would throw any light on the etiology of the condition. There are, as is well known, two rival opinions on the relation of prostatitis to hypertrophy. According to one—recently advocated by Ciechanowski on the basis of extensive, but I think mistaken, pathological observations—prostatic hypertrophy is merely a late stage of inflammation. By the prostatitis the openings of the ducts are blocked, and the so-called hypertrophy is nothing more than a dilation of the glandules behind the obstruction. According to the other opinion—recently urged by Keyes after a study of clinical statistics—prostatic hypertrophy and prostatitis bear no etiological relation to each other. The pathological observations of Hallé, Motz and Albarran are in strong confirmation of this view.

As Geraghty has recently shown in confirmation of the observations by others, urethritis does not occur in the dog. Prostatic hypertrophy, however, does occur. Do not these two facts disprove the inflammatory theory of prostatic hypertrophy? They would, except for the fact that prostatitis, in spite of the absence of urethritis, is of frequent occurrence in the dog. This same phenomenon is observed clinically also in man; in any large genito-urinary practice, cases of definite prostatitis, often with troublesome symptoms, are seen in patients who have neither the history nor the signs of previous urethritis.

Prostatitis, then, occurs without urethritis; and we cannot argue that the absence of urethral inflammation in the dog absolutely disproves the inflammatory theory of prostatic hypertrophy.

On the other hand, the argument of Ciechanowski, that the frequency of acute urethritis and of prostatic hypertrophy in dogs goes to prove their etiological relationship falls, of course, completely to the ground when one knows that what many have regarded as urethritis is really a balano-posthitis, and that a true urethral inflammation in the dogs does not seem to have been demonstrated.

Prostatic atrophy.—In examining dogs in the Hunterian Laboratory to obtain normal prostates for comparison with the hypertrophied gland just described I came across a specimen of prostatic atrophy which is of interest in this connection. The specimen, which is shown in Fig. 14, came from a dog on which double castration had been done three months previously. It consisted of a small bladder, measuring 2 x 2.5 x 1 cm., which was quite normal in appearance. The prostate was, however, only represented by a tiny nubbin of tissue measuring 1 x 0.5 x 0.75 cm. It was separated from the bladder by a neck of the urethra about 0.5 cm. long. The gland, on section, was so small that its gross appearance cannot be described; its cross section was largely occupied by the normal patulous prostatic urethra.

The microscopical examination (see Fig. 7) showed that there had been almost complete substitution of connective tissue for gland tissue. The acini were represented by scattered groups of epithelial cells which had for the most part lost their normal contour and were represented almost entirely by irregular and apparently degenerating nuclei. The lumina of the acini had almost entirely disappeared, though here and there a small space in the centre of a group of epithelial cells represented the remains of a lumen. The richly cellular prostate of the normal dog had become a fibrous prostate.

XIV. THE PARASITES OF BALTIMORE DOGS.

By S. J. Crowe.

The object of this investigation was to determine the varieties of parasites which infect the canine population of Baltimore; to tabulate them, and to note whether any are identical with the parasites known to occur in man. The observations are of value as a preliminary step to the study of the dog's blood, which we hope to take up the following year in the Hunterian Laboratory.

The presence of large numbers of intestinal worms, occasionally of Filaria, and of the great round worm (Dioctophyme Renale) has been observed at autopsies in the various laboratories here for many years. In 1889 Dr. Welch[1] gave a brief description of a number of parasites which he had observed in dogs. Among them was a giant round worm 95 cm. in length. Other specimens have since been seen in various animals, the worms being always free in the peritoneal cavity.

[1] Wm. H. Welch. Animal Parasites. Johns Hopkins Hospital Bulletin, 1890. Vol. I, p. 72.

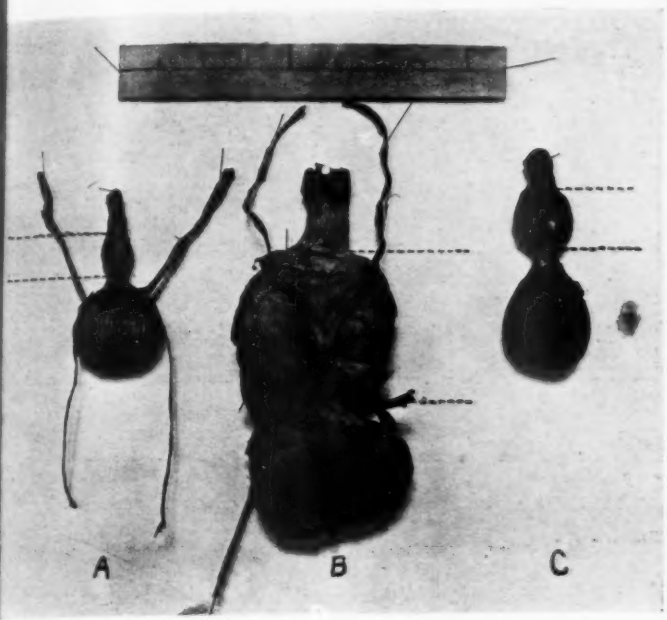

FIG. 1.—*A*. Atrophy of the dog's prostate. Specimen includes bladder, ureters, vasa deferentia, and a portion of the membranous urethra. The dotted lines indicate the anterior and posterior limits of the prostate.

B. Hypertrophy of the dog's prostate. Specimen includes bladder, ureters, and vasa deferentia.

C. The dog's normal prostate and bladder.

The large divisions in the scale at the top of the figure represent inches.

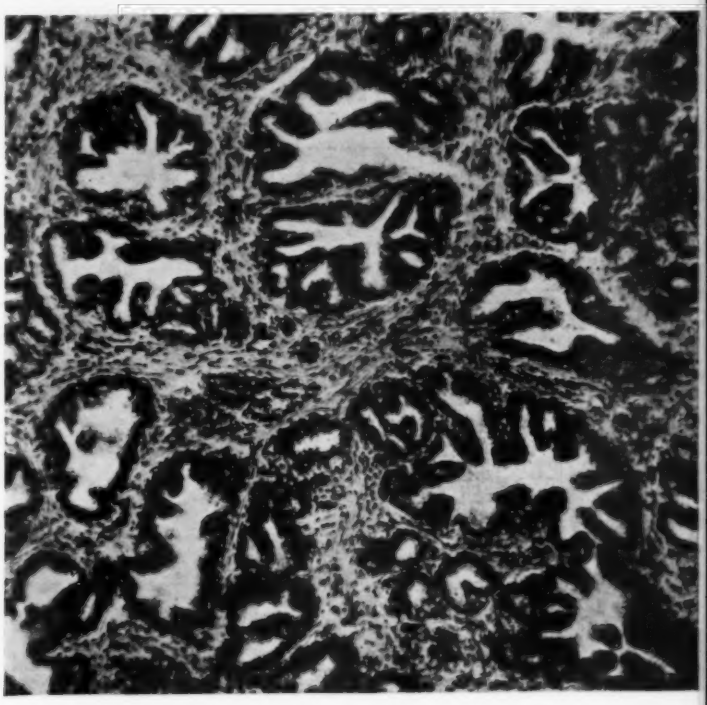

FIG. 2.—Section of normal dog's prostate to show its richness in acini. The picture is the same throughout the gland.

FIG. 3.—Section of hypertrophied prostate in the dog. In this field numerous normal acini are seen. Notice also the marked round-celled infiltration.

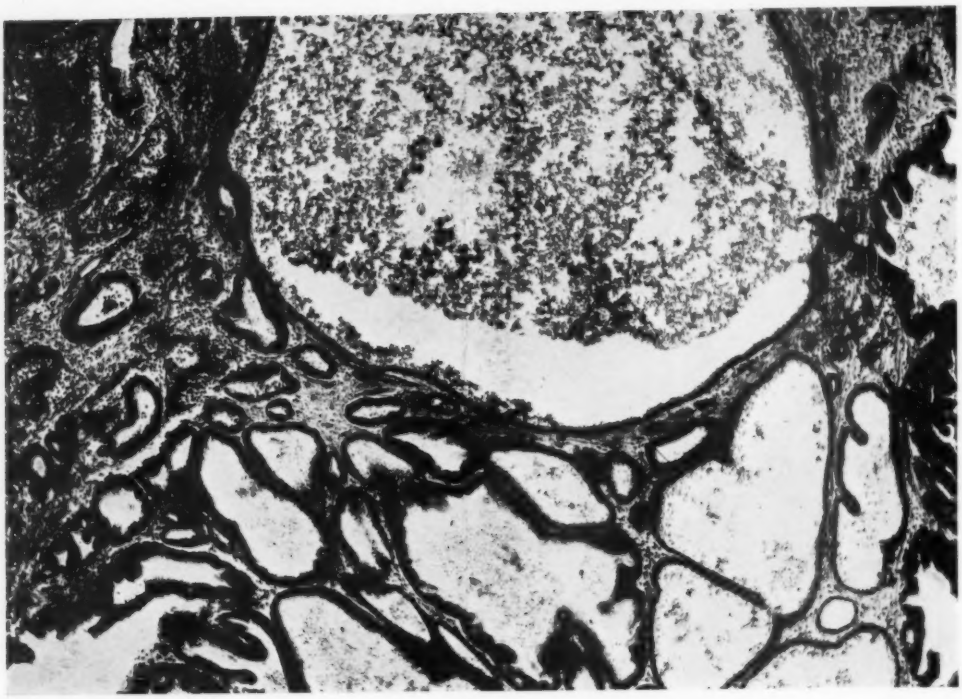

FIG. 5.—Prostatic hypertrophy in the dog, showing marked dilation of the acini.

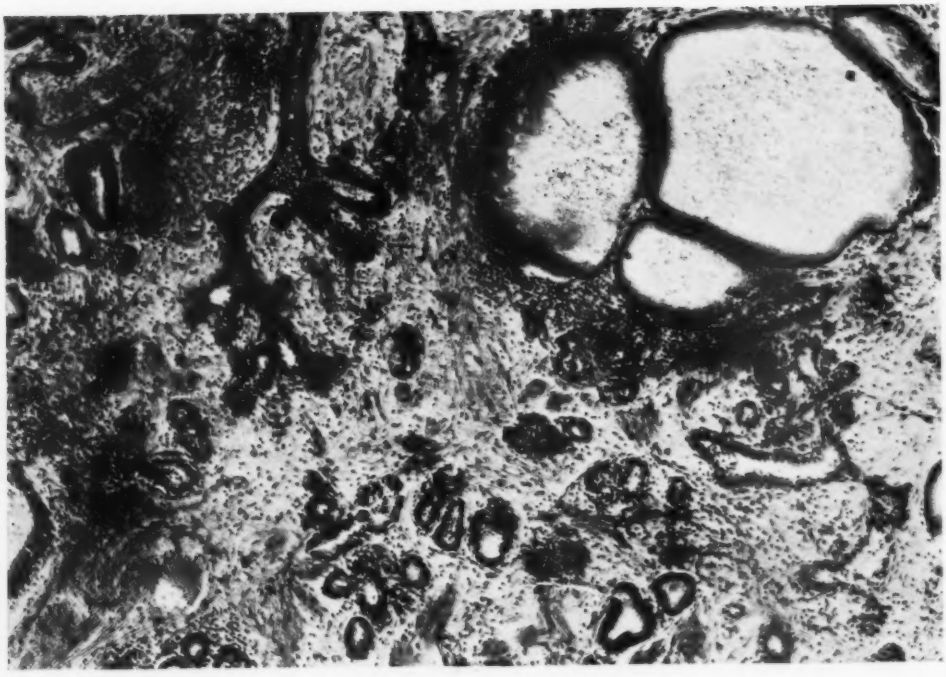

FIG. 4.—Section of hypertrophied prostate in the dog. Normal, moderately enlarged, and greatly dilated acini are seen.

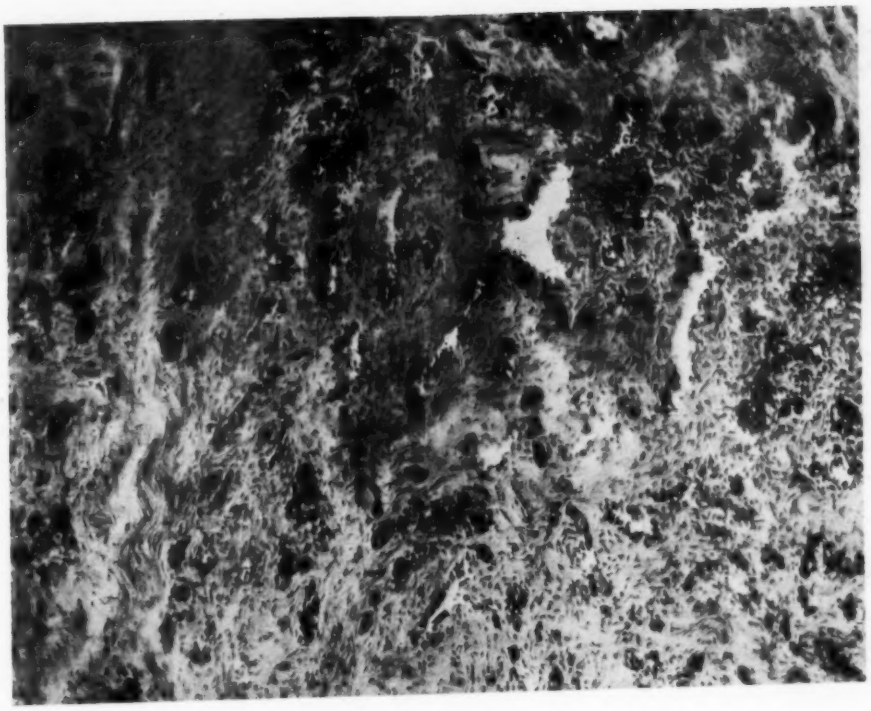

FIG. 7.—Prostatic atrophy in the dog, following double castration.

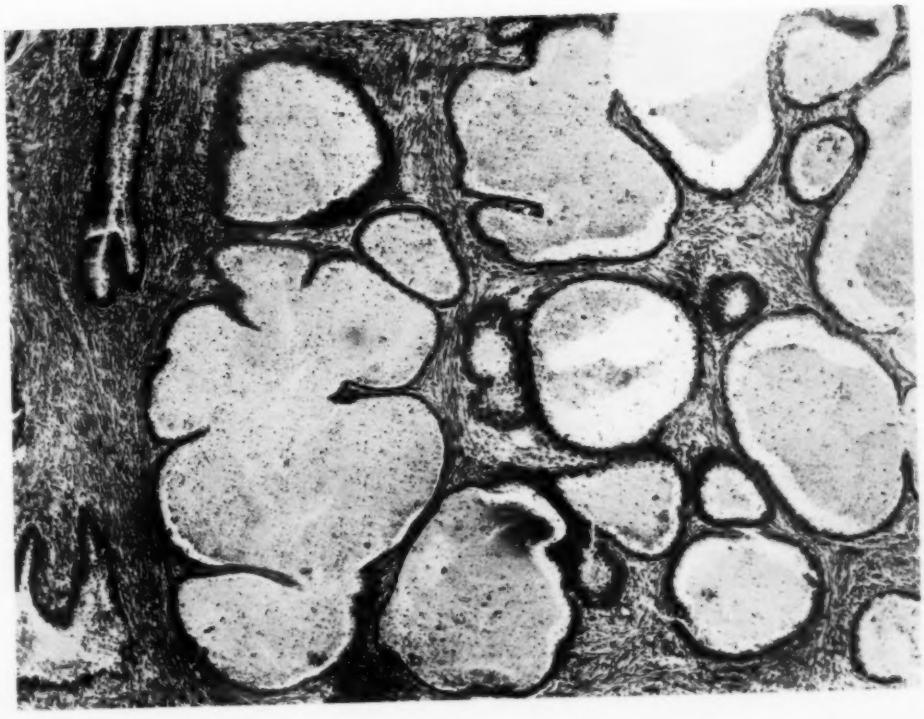

FIG. 6.—Prostatic hypertrophy in man.

The eosinophilia, due to intestinal parasites, has caused considerable confusion during the course of investigations on the blood of dogs; and since the Hunterian Laboratory has been opened the constant presence at autopsy of some variety of intestinal worm has been especially noticeable. It is in fact extremely common, during intestinal resections, to cut down on a mass of round or flat worms. A number of animals furthermore have died during the first stage of ether anæsthesia, and at the subsequent examination the right heart and pulmonary artery have been found packed with Filaria. Six cases of this sort have recently been reported from this laboratory with autopsy findings.[2]

Methods.—During the past six months post-mortem examinations have been made on 160 dogs. The alimentary tract, from the cardia of the stomach to the anus, was removed and opened. The parasites found were placed in bottles of warm water, the part of the intestine in which they occurred being noted. Smears were made from the gall passages of 39 dogs and examined microscopically, but in no case was there found a liver fluke of any variety. Opisthorcis Pseudo-filineus was especially looked for.

I wish to thank Dr. Charles Wardell Stiles, Chief of the Division of Zoölogy in the Hygienic Laboratory, U. S. Public Health and Marine Hospital Service, for his numerous helpful suggestions, especially in regard to the technique for the preparation and mounting of specimens.

It was found by experience that the flat worms could be stained much better after being fixed between two glass plates, just enough pressure being used to spread the segments out thinly.

The round worms—After being washed:

(1) Place in a hot alcohol solution of corrosive sublimate.

(2) Wash in running water over night.

(3) Place in 70% alcohol with enough iodine to color, more iodine being added as the solution clears up—when it does *not* clear up it means that all the sublimate has been removed.

(4) Put in 95% alcohol (95 parts) plus 5 parts glycerine, and allow to evaporate slowly.

No attempt was made to stain the round worms.

The flat worms—Wash in warm water and allow to macerate in water for 12 hours; or to fix immediately:

(1) Put between two glass plates; clamp them together and immerse the whole in a hot alcohol solution of corrosive sublimate.

(2) Wash in running water over night.

(3) Remove excess of sublimate with iodine plus alcohol if you wish to stain them.

(4) Place in glycerine with plus alcohol and allow to evaporate; alcohol 80-95-70%.

(5) Overstain with acid carmine—decolorize with acid alcohol.

(6) Put in glycerine with plus alcohol to clear.

Parasites found.—From the total of 160 dogs the following seven varieties were found:

(1) *Trichuris depressuscula* (whip-worm) was found in the cæcum of 159 dogs—99.3%.

(2) *Anchylostoma caninum* (hook-worm) was found in the small intestine of 120 dogs—75%.

(3) *Toxacara canis* (common eel-worm) was found in the small intestine of 47 dogs—29.3%.

(4) *Dioctophyme renale* was found only once, free in the peritoneal cavity.

(5) *Filaria immitis* (thread-worm) was found in the right heart and pulmonary arteries of 3 dogs—1.9%. Embryos were found during life in the circulating blood of one animal, of which no post-mortem examination was subsequently obtained.

(6) *Tænia pisiformis* was found in the lower part of the small intestine in 23 dogs—14.4%.

(7) *Dipylidium caninum* was found in the lower part of the small intestine in 112 dogs—70%.

Thus the whip-worm, the hook-worm and the common double-pored tape-worm are almost constantly present in the intestinal tract of dogs.

Trichuris depressuscula (whip-worm) was found in the cæcum of every dog except one; this was a large bulldog, which had never been allowed to run on the streets, but had always been well taken care of and well fed. He died suddenly during an operation on the stomach, and on subsequent examination a round-celled sarcoma was found in the wall of the left ventricle.[3] No parasites of any description were found in his body. The whip-worm of *man* also is one of the most frequent of human parasites, and it is closely related to the species occurring in dogs. All varieties are characterized by the extremely long filiform neck—$\frac{3}{4}$ of the entire body length. The tail, of the male, is curled up, and the spicule protrudes. The eggs are characteristic—oval in shape, with plugs in both ends. An intermediate host is not necessary for their development and dogs constantly reinoculate themselves. The eggs, after being discharged in the fæces, undergo development, and with the contained embryo are swallowed in water or food.

Neither in man nor in animals does it seem to give rise to any symptoms. Guiart, of Paris, has recently advanced the view that whip-worms form the portal of entry for typhoid bacilli. The examinations made in Washington, D. C., by Dr. Stiles, of 200 typhoid patients failed to bear this out, however. Dr. Kelly, in his book on Diseases of the Appendix, says: "There is undoubtedly an etiologic relation between appendicitis and some forms of intestinal parasites . . . . In several instances children with symptoms of appendicitis have been entirely relieved by santonin. Metchnikoff (Semaine méd., 1901, No. II) justly lays stress upon the necessity of microscopical examination of the stools for ova in all cases in which there is any room for suspicion, a measure especially important in children. The rôle of the worms may be to produce an erosion of the mucosa, and so open the way for the invasion of bacteria."[4]

Sections through the walls of the cæcum of dogs show that

[2] Six Cases of Infection with Filaria Immitis. J. G. Hopkins. Johns Hopkins Hospital Bulletin, Vol. XVII, December, 1906, p. 377.

[3] Bryant. Cf. No. XVII of these reports.

[4] Kelly-Hurdon: Vermiform Appendix and its Diseases.

the whip-worm does burrow into the mucosa to a slight extent, but excites no inflammatory reaction whatever.

Anchylostoma caninum (hook-worm).—The species occurring in dogs is not identical, but closely related to the Uncinaria of man.[5] They have a heavy armature of sharp teeth, and the head is often found imbedded in the mucosa, and surrounded by a small extravasation of blood. Frequently eight or ten are seen together within an area the size of a quarter, which is injected and considerably thickened (probably due to secondary bacterial infection). The hæmorrhagic enteritis, which is frequently seen in dogs, especially after an operation, is *associated* in many instances with a heavy *hook-worm* infection. In two such cases of bloody diarrhea last year an infection with Coccidium Bigeminum was found (Bancroft-Cross, Johns Hopkins Hospital Bulletin, 1906, No. 189). Positive evidence that the hook-worm was the cause of anæmia in these animals could not be found. The life cycle and mode of infection is probably much like that for the Uncinaria of man—that is, the eggs escape in the fæces and rapidly develop in the presence of moisture.

Infection of man takes place in two ways:

(1) The larvæ penetrate the skin, reach the circulatory system, pass through the heart to the lungs, from the lungs to the air passages, up to the larynx, down the œsophagus to the stomach and to the small intestine, where they develop into adults. Looss has experimentally demonstrated that this is a common mode of infection. *Ground-itch* is supposed to be the initial lesion in man, but although carefully looked for, no such lesions could be demonstrated in the infected dogs.

(2) A second mode of infection is through the mouth, with contaminated food and water.

Toxacara canis (Fig. 8).—This is the common eel-worm of dogs and cats. It is easily recognized by its arrow-shaped head. Eight cases have been reported in man—in most of these the worms were vomited. They were found in 47 of the dogs examined. In one, a bulldog, there were about 200 individuals, most plentiful in the upper duodenum, but in relatively large numbers as far down as the cæcum. It looked as if they must certainly have caused an intestinal obstruction. The common dog tape-worm (Dipylidium Caninum) is almost invariably entangled with them. Just as with Ascaris Lumbricoides of man, the development is without an intermediate host. The eggs escape in the fæces, and slowly develop into embryos. If these are swallowed with contaminated food, water, or from dirty hands, the embryos develop directly into the adult, which explains the varying size of the worms found in the intestines. The infected dogs seem to show no symptoms, although occasionally the worms are passed in large numbers. Dr. Stiles has found the eggs in the intestines of the common house fly.

Dioctophyme renale (Eustronogylos Gigas) (Fig. 9).—This is one of the largest round worms known. It was found once in this series. It occurred in a small male fox-terrier. He was rather emaciated, but had otherwise shown no symptoms. In the literature it is described as occurring most frequently in the kidney, but in this instance it was found lying free in the abdominal cavity.[6] The kidneys were grossly and microscopically normal in appearance, and there was no free fluid, or demonstrable lesion of the peritoneum. This specimen was 74 cm. in length, and of a bright red color with black stripes running longitudinally. It felt soft and fluctuating, much like a soft rubber tube filled with water. It is said to occur in the kidney of dogs and various other animals; and about a dozen cases have been reported in man. But in the laboratories here it has invariably been found free in the peritoneal cavity. At a meeting of the Johns Hopkins Medical Society in March, 1890, Dr. Welch showed a specimen of this worm, 95 cm. in length. It was found free in the peritoneal cavity, and he mentions that it has been found three times previously in dogs used for experimental work. The source of infection is not known.

Filaria immitis.—Four dogs were found to be infected with this parasite. Two of the dogs died during an ether anæsthesia; a third took ether well and recovered from a gastrostomy. He was finally sacrificed and at autopsy the cavity of the right ventricle contained a mass of long, white, thread-like worms, varying from 10 to 25 cm. in length (Fig. 10). They extended out into the pulmonary arteries of both lungs, apparently blocking the lumen almost entirely, and interfering with the action of the pulmonary valves to a considerable extent. One worm was found in the inferior vena cava between the liver and heart.

Mosquitoes, anopheles and culex form the intermediate host.

There is no well authenticated case of infection of man by this parasite.

Tænia pisiformis.—This is a tape-worm which dogs contract by eating rabbits infected with Cysticercus Pisiformis. It was found in the lower portion of the small intestine in 23 of the dogs examined. Vital, in 1874, reported the occurrence of this tape-worm in man, but the correctness of the zoölogical determination is doubtful; especially since Galli-Valeria, in 1898, was unable to inoculate himself by swallowing the larval stage. It can be easily produced in dogs by feeding a rabbit's liver containing the cysticercus forms.

The adult varies in length from two to four feet; the head is surmounted by a short, thick rostellum, which has a double row of hooks. The genital pores open laterally, irregularly alternate, and are very prominent.

[5] Stiles. Osler's Modern Medicine, Vol. I, 1907. U. Americana causes in man: tunnel disease, miner's anæmia, brickmaker's anæmia, etc.

U. Stenocephala occurs in dogs, foxes, etc., and causes considerable trouble in the blue fox industry.

U. Trigonocephala occurs in sheep and produces a serious anæmia. In Victoria and Calhoun Counties, Texas (in conjunction with the twisted wire-worm—Hæmonchus Contortius), it causes the death of 25% to 59% of certain flocks.

U. Lucosci in seal pups (Alaska). It is responsible for about 17% of deaths of the pups.

None of the species from animals are known to infect man.

[6] Since this writing a second case of infection with this worm has occurred among the laboratory animals.

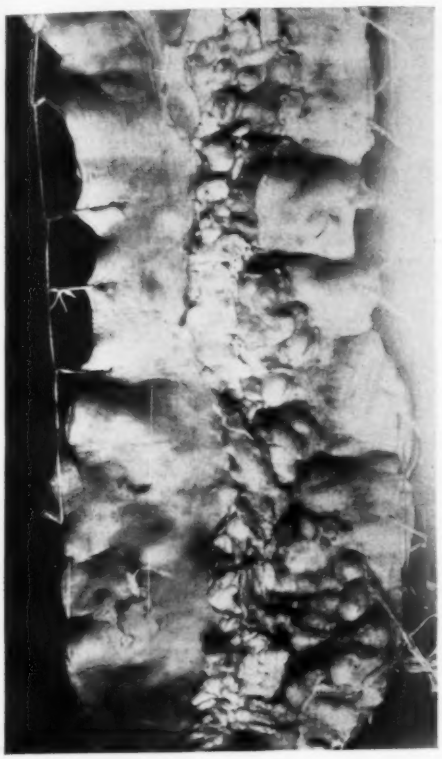

FIG. 12.—Œsophagostoma Columbanum; encysted embryo in the intestine of the sheep.

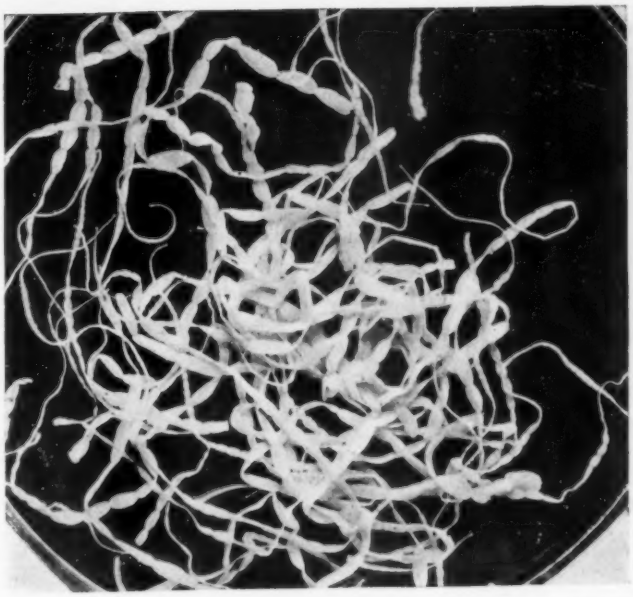

FIG. 11.—Dipylidum Caninum; from the small intestine of the dog.

FIG. 10.—Filaria Immitis; showing presence of the parasites in the right ventricle and pulmonary arteries.

FIG. 8.—Toxacara Canis; from small intestine of dog.

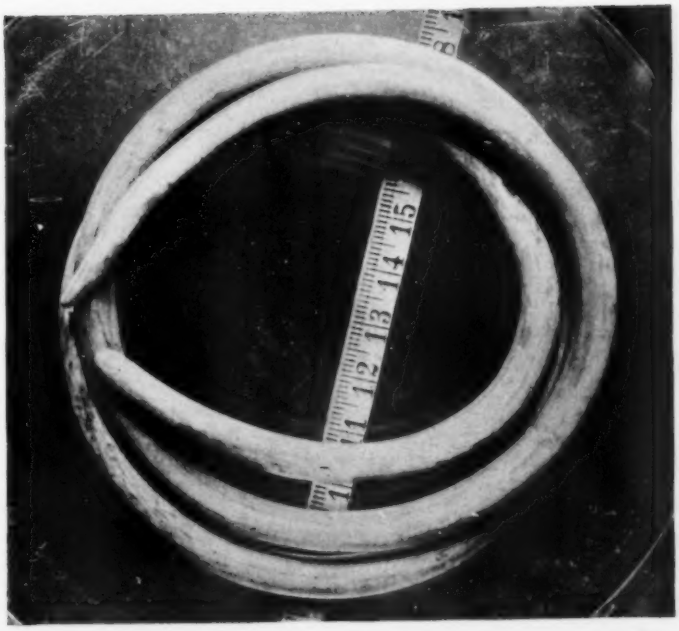

FIG. 9.—Dioctophyme Renale; from peritoneal cavity of dog.

Dipylidium caninum (Fig. 11).—This is by far the most common tape-worm found in dogs. It is small—from 10 to 30 cm. in length, and is easily recognized by its double set of reproductive organs, with the genital pores opening laterally on both sides. The head is small and has a conical rostellum which is armed with several rows of very minute hooks. The parasite has very little, if any, effect on its animal host. The larval stage lives in the lice and fleas of dogs, and in the human flea. These insects become infected with the larvæ while they are gnawing at the matter attached to the hairs of the dog. In trying to rid himself of the fleas the dog swallows some of the larvæ and so becomes infected.

Other parasites.—In addition to the dogs, a few rabbits and a goat were examined.

Coccidium oviforme.—The livers of two rabbits were found studded with small, yellowish patches, and on microscopical examination numerous characteristic oval bodies were seen. The cysts were seen to be dilated gall-ducts, lined with columnar epithelium, which projected, as folds, into the lumen. Lying free in the cavity and embedded in the epithelium were thousands of the small, oval bodies.

Several cases of infection of man with the Coccidium Oviforme have been reported, the liver, kidneys and intestines being most frequently affected.[7]

Œsophagostoma columbanum (Fig. 12).—One sheep, which had been used for parathyroid experiments, was autopsied. On opening the peritoneal cavity numerous prominent nodules were seen in the wall of the large intestine, varying in size from 3 cm. to 0.5 cm. in diameter. On section they were firm and filled with a greenish, cheesy mass. Under the dissecting microscope a small embryo-worm could be gotten out, which was just visible to the naked eye. The adult worms, which are about the same size and closely related to the hookworm, were found in the lumen of the intestine.

The life cycle outside the sheep is not known; the youngest known forms are those encysted in the walls of the intestine. After several months they leave the cysts and begin adult life in the intestine. They seem to cause but little trouble, but in some cases general debility and diarrhea are associated with their presence.

[7] Leukart: Parasiten des Menschen.

Among the other parasites which occur in both man and dog are:

(1) *Dibothriocephalus latus.*—The large, broad tape-worm which varies from 15 to 30 feet in length. The larval stage is found in the muscles and organs of fresh water fish. "The special medical significance of an infection with the broad tape-worm is the tendency to develop a severe anæmia, resembling pernicious anæmia, and supposed to be due to a toxin." The red blood count may be as low as 1,300,000.

(2) *Ecchinococcus.*—This is one of the smallest tape-worms known. Cases of infection occur most frequently in Iceland, and most of the cases in the United States occur in immigrants who were probably infected before they came to this country. The adult worm occupies the upper half of the small intestine, but never close to the stomach. The larval stage occurs in hogs, sheep, cattle, etc. Man is probably an accidental host. The eggs are discharged in the dog's fæces, become matted in his hair, and man is probably infected from hands soiled while petting dogs. "Iceland is recognized as the classical Ecchinococcus land—the most conservative statistics give the infection as from 1 in 43 to 1 in 63 of the inhabitants. Krabbe reports it for 25 per cent of the dogs."[8]

No case of infection was found in these dogs, although smears from the duodenum of 50 dogs were examined microscopically.

As regards prevention, Dr. Stiles says: "Since this disease is transmitted from dogs to man, and since dogs obtain their infection more particularly from eating the infected organs of slaughtered sheep, cattle and hogs, it is clear that any plan of prevention must follow two lines:

(1) Dogs should be kept away from slaughter houses . . . . ; and the rule that no dog which enters a slaughter house or its refuse yard should ever be allowed to leave would, if carried out, save many lives and much valuable stock.

(2) All stray dogs should be killed—the dog pound is an institution of practical hygienic importance."

Neither of these parasites were found in this series of dogs, but the possibility of their occurrence should always be borne in mind.

[8] Stiles in Osler's Modern Medicine, Vol. I, 1907.

XV. OSTEO-SARCOMA OF THE RADIUS IN A DOG.

By F. F. GUNDRUM.

History.—The patient, "Caesar," a thoroughbred Great Dane, after some correspondence in regard to his condition, was admitted to the clinic on January 15, 1907. His owner gave the following account of his malady:

The dog is five years of age. He has always been an active and spirited animal, and a prize-winner at several bench shows. About one year ago (January, 1906) a small enlargement appeared on the right foreleg just above the wrist joint. Though firmly attached to the bone, this growth did not seem to be painful or tender and was not adherent to the skin. The swelling slowly increased in size (Fig. 13) until in October, 1906, when it was incised by a veterinarian, under the impression that it was a "bone abscess." No pus was found, but the incision caused a profuse hæmorrhage, which was controlled with difficulty. The wound has never healed and the swelling has continued to enlarge.

In November, 1906, an X-ray photograph (Fig. 14) was taken, which showed a large tumor arising from the shaft of the radius. About a month later, December, 1906, what seems to have been a

pathological or spontaneous fracture occurred, accompanied by rather free bleeding from the granulating wound. During the past six weeks the tumor has grown rapidly and the whole leg has become very much swollen. The animal has not used the leg in walking since the fracture took place, due apparently to the fact that it will not support his great weight, rather than to any pain which the effort occasions.

Examination.—The animal is a beautiful example of his species, standing 2 feet 10 inches in height at the shoulder, and weighing 160 pounds. Aside from the local lesion the physical condition reveals no abnormalities.

Just above the wrist-joint of the right fore leg there is a hard, roundish enlargement, which greatly deforms the thin shaft of the limb. The tumor is about 35 cm. in circumference and has evidently arisen from the bone—the radius alone being involved, as shown by the X-ray. On the front of the tumor (Fig. 15) there is a sharply outlined ulcerated area, 7 x 5 cm. in its surface dimensions and 1.5 cm. in depth. The ulcer has a necrotic base and discharges a thin, foul-smelling fluid. On palpation the tumor is of stony hardness, except at the base of the ulcer, which is spongy and bleeds easily. The skin overlying the tumor is œdematous and seems to be firmly attached to the growth. Though the entire leg from shoulder to toes is swollen to nearly double the size of the opposite leg, the foot is particularly œdematous. A large, firm gland can be felt in the posterior axillary fold. On manipulation of the paw, crepitus is easily elicited, owing doubtless to a pathological fracture. There is no especial tenderness and the animal does not hesitate to put the paw to the ground in walking, though he spares it by limping.

A diagnosis of osteo-sarcoma in this case was easily made, and although the histological character of the tumor was not certain it was thought to be of the spindle-celled variety—a form which in man is attended with a grave prognosis. The ulceration of the growth, furthermore, added to the seriousness of the condition. It was impossible to tell whether the palpable glands were enlarged through inflammatory hyperplasia or metastatic involvement.

As the animal, aside from being a great pet, was particularly valuable for breeding purposes, it was determined, at the owner's solicitation, to attempt an amputation at the elbow-joint in the hope of prolonging his life and usefulness.

Operation.—After a preliminary injection of morphia the patient was placed on the table, the ulcerated wound was disinfected and the entire extremity shaved and prepared before the administration of ether. A racquet-shaped incision was made through the skin about the elbow-joint and the flap turned back. The tissues were found to be boggy and the cutaneous veins unusually large and numerous. As the dissection was carried down to the main vessels of the limb on the inner side of the humerus the operator encountered a dense, white cord of tissue, completely surrounding the brachial artery and vein. This solid cord, in which the brachial vessels were embedded, was presumed to be a lymphatic extension of the new growth upward from the tumor. The operation consequently was abandoned at this point in favor of a higher amputation. A new incision was made about the shoulder, where the leg was almost as large as a child's thigh, and after a long dissection, when the axillary vessels were exposed it was found that the same cord of new tissue ran in a continuous line from the tumor to the very apex of the axilla and to the wall of the thorax. Deeming the case a hopeless one, from the certainty of early recurrence, probably in the operative wound itself, the dog was not allowed to recover from the anæsthetic.

Autopsy. The abdominal and thoracic organs were found to be practically normal. There were a few vegetations on the mitral valve, due to an old endocarditis. There were no signs of internal metastases.

Tumor. On gross examination it was seen on section of the tumor (Fig. 16) that it consisted of two quite distinct forms of tissue; a central portion, soft, red, spongy, and containing several spicules of bone, and a peripheral portion showing a firm, dense, whitish growth, resembling in its appearance the cord of tissue which, at the time of operation, was found to extend along the vessels upward into the axilla. Four enlarged glands were found at autopsy, one near the elbow and three in the neighborhood of the axilla. All showed firm, white areas which from their macroscopic appearance were considered to be metastases.

From the gross appearance a pathological diagnosis was made of sarcoma of the radius with extension to the lymph vessels of the leg and to the axillary glands.

On microscopic examination of the tissues the soft, central part of the tumor proved to be a spindle-celled sarcoma which contained, in addition, a number of giant cells. There was a scanty fibrous tissue framework. The dense, white surrounding growth, which had extended to the lymphatics, consisted of a rather œdematous fibrous connective tissue, very rich in blood-vessels, but on sections taken from near the tumor, the elbow, and the shoulder, no typical spindle cells resembling the original tumor were seen. All the lymph glands showed sinuses crowded with large phagocytic cells, many of which contained modified blood pigment. In every gland were evidences of endothelial hyperplasia, but in none were definite metastases or any spindle cells seen. The microscopical diagnosis was spindle-celled sarcoma with giant cells, fibroid induration around the tumor and great vessels, and endothelial hyperplasia of the lymph glands.

Discussion.

Most authorities agree that sarcoma is a less common tumor in dogs than carcinoma, and this corresponds with our experiences at the Hunterian Laboratory. During the past three years, although there have been a number of mixed tumors, we have seen only five other instances of primary sarcoma; one in an undescended testis (4), one in the heart wall, the third a periosteal sarcoma of the head of the humerus, the fourth a melanotic sarcoma of the scrotum, and the fifth a fibro-sarcoma of the neck with hepatic metastases.

Cadiot (1) states that bone sarcomata occur in dogs of all ages and species, but these tumors seem especially liable to appear in animals which have been kept in confinement and have lived on a meat diet. Further, bone sarcomata are rare and nearly always recur after operation, so that the prognosis is very unfavorable.

Hobday (2) also emphasizes the hopeless outlook in sarcomatous tumors of bones.

On the other hand French (3) draws a sharp distinction in regard to the prognosis between the periosteal and medullary varieties and considers the latter to be relatively benign, especially since they are tardy in giving metastases. Sarcomata, according to this same author, are especially likely to occur about the head, sternum, and the ends of the long bones. Early lameness is an extremely important symptom in sarcoma of the long bones, for it is very suggestive of a medullary growth.

As in the case we have recorded, the failure to recognize the true nature of these tumors at an early date and to give them the benefit of surgical treatment makes statistics very meager and, from an operative standpoint, quite unreliable.

FIG. 13.—Photograph of patient taken in October, 1906, showing appearance of tumor before exploratory incision was made.

FIG. 14.—Radiograph of osteo-sarcoma of the radius.

FIG. 15.—Photograph of tumor before operation, showing ulcerated area; slightly reduced.

FIG. 16.—Section through the centre of the growth; reduced one-third.

A great majority of the animals thus afflicted are sacrificed without attempting a surgical cure.

An early amputation in our patient would doubtless have saved his life, and it is quite possible that this might have been accomplished even at the late date it was attempted had we not depended on the macroscopic appearance alone of the cord of tissue met with at the operation, supposing it to be an extension of the disease. The nature of the primary growth was recognized before the amputation was undertaken, but it was hoped that the tumor had remained a local one. Although sarcomata usually spread by way of the blood-vessels, the direct continuity with the original neoplasm of the ascending column of solid new tissue made it seem unlikely that a mere lymphatic hyperplasia could account for the condition observed. The failure to find any tumor cells in the microscopical examination of the tissues taken from three or four different levels, does not exclude the possibility of there having been metastases in other areas of the fibrous growth, but it demonstrates at least that not all of the new formation was sarcomatous in origin. Sections also were made from all of the enlarged glands, and in them likewise it is probable that the abnormality seen in the gross was due to the action of toxines and phagocytic cells in the lymphatics which drained the infected and ulcerating growth below.

The spindle-celled sarcomata with giant cells are, in man, of comparatively low malignancy, and, although there are no very definite data on the subject it does not seem improbable that the same may be true in a general way in dogs. The course of this case seems rather to point toward that conclusion. The experience with this patient, therefore, shows how misleading the gross appearances of a column tissue involved in chronic lymphangitis may be, and shows furthermore that an attempt to save life under similar circumstances in the future may be justifiable. Our previous experience with amputations—even those of the interscapulo-thoracic form and in large animals—has taught us that mutilating operations of this kind leave the animal almost as active and as well able to care for himself as when the possessor of four legs.

The literature on bone sarcoma in dogs is not very extensive and no attempt has been made to give all the references. Probably the most satisfactory discussion is to be found in French's recent work.

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XVI. ON THE ALTERATIONS IN BODY TEMPERATURE PRODUCED IN DOGS BY MORPHIA AND ETHER.

By CHARLES WILSON MILLS.

These observations comprise data secured in four different ways.

First.—A compilation of the temperature curves of animals taken during operations in the regular third year course of operative surgery. All of these dogs were anæsthetized with ether, after a preliminary injection of morphia.

Second.—Observations to determine the effect on temperature of morphia alone.

Third.—Observations to determine the effect on temperature of ether alone.

Fourth.—Observations to determine how greatly the morphia and ether temperature curves may be influenced by the application of external heat.

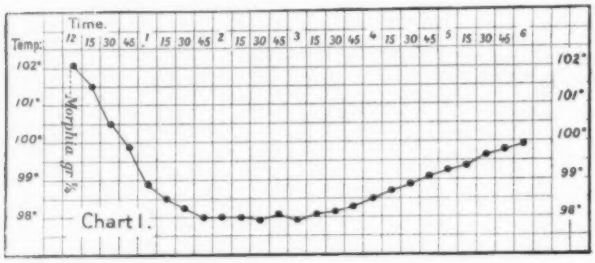
Though this was the sequence in which the observations were made they seem more logically to fall into the following order: First, the effect of morphia alone; second, the effect of ether alone; third, the effect of morphia and ether, no unusual precaution being taken to preserve body heat; fourth, the effect of morphia and ether when such precautions were taken. The figures record the rectal temperatures.

Group I. Showing the effect of morphia alone.—Records of three dogs, after the administration of ¼ grain morphia hypodermically. Animals in usual position on operating tables without covering:

	Before morphia.	½ hr. after.	1 hr.	1½ hr.	2 hr.	3 hr.	4 hr.	5 hr.	6 hr.
1.	101.0°	99.0°	98.4°	98.0°	98°	97.6°	98.0°	98.8°	99.2°
2.	102.0°	101.2°	99.6°	99.2°	99°	99.2°	99.8°	100.6°	101.2°
3.	103.4°	101.2°	98.6°	97.6°	97°	97.0°	97.6°	98.6°	99.4°
Average	102.1°	100.5°	98.8°	98.3°	98°	97.9°	98.8°	99.3°	99.9°

The curve on following page was plotted from the averages of the figures, taken in these three cases at 15-minute intervals

These figures indicate that morphia alone, in dogs, unprotected by covering or by external heat, produces a fall in temperature with a curve showing the following characteristics: *First,* a steady fall for 1½ to 2 hours, amounting to from 3° to 5° drop below normal. *Second,* the temperature then

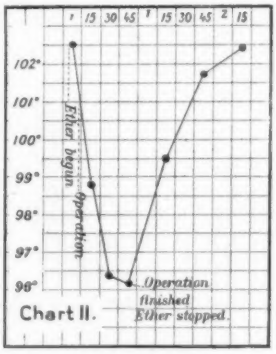


remains constant at this lowest level for about 2 hours. *Third,* at end of this second period, or in from 3½ to 4 hours from the administration of the drug, the temperature begins gradually to rise again, the rise being so slow that at the end of six hours it is still from 1° to 3° below normal. During this period the dogs are gradually recovering from the effects of the morphia.

Group II. Showing the effect of ether alone.—Records of six dogs. Operation, laparotomy. Moderately cold room and dogs not protected. Ether administered during operation for about 45 minutes in every case:

	Before ether.	15 min. after.	30 min.	45 min.	1¼ hr.	1¾ hr.	2¼ hr.
1.	102.4°	99.6°	96.4°	98.2°	100.4°	100.4°	102.4°
2.	102.6°	98.0°	95.6°	95.2°	98.5°	101.6°	....
3.	102.2°	98.2°	96.4°	95.6°	...	....	....
4.	102.0°	100.0°	97.8°	96.6°	...	....	....
5.	102.8°	98.0°	96.0°	96.6°	99.6°	101.6°	....
6.	103.0°	98.4°	95.6°	94.6°	...	....	....
Average	102.5°	98.7°	96.3°	96.1°	99.5°	101.2°	102.4°

The curve plotted from these averages is shown below:



These figures show that ether alone causes a fall in temperature in unprotected dogs. The fall in these cases was about 6° during the first half hour, but the coldness of the room makes this fall much greater than would have taken place under ordinary operating-room conditions. On discontinuance of ether the temperature rapidly rose, reaching normal in about 1½ hours, at which time the dogs had recovered from the anæsthetic.

Group III. Showing the effect of the combination of morphia and ether.—Records of 26 dogs, all operated on. Morphia, ¼ grain, administered 2 hours before beginning the administration of ether. Three of these animals were sacrificed, and 23 were allowed to recover from the anæsthetic. The lowest temperature during the course of the various procedures varied from 98.4° to less than 94°. The amount of the fall, however, seemed to have no definite relation to the operative recovery, although there was no mortality among the animals whose temperature did not drop below 98°, whereas 50 per cent of the small number with a fall to 94° subsequently succumbed. The matter probably bears some relation to pulmonary complications.

The size, sex and breed of the dog were noted on some of the records, and it would seem that the prognosis is better for large than for small animals, and better for males than for females.

With the exception of three major amputations the operations were all abdominal sections. The drop in temperature was fully as pronounced in the former as in the latter, the lowest temperature in the three amputated dogs being 94.5°, 95.5°, and 94.5° as against an average of 96.3° for the whole series. The fall in temperature, therefore, apparently does not depend on the exposure of the abdominal cavity and cooling of the viscera.

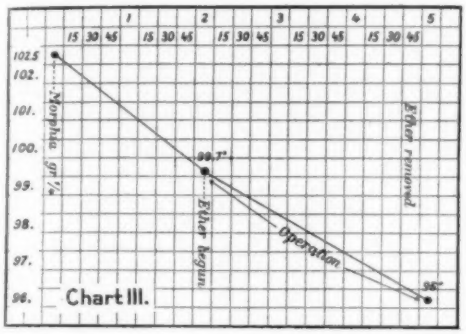
The temperature records of this set of dogs show in every case a fall of temperature following the administration of ether. In many of the dogs this fall was later followed by a rise. The records have accordingly been divided into two classes: (1) those showing a continuous drop during operation, and (2) those showing a preliminary drop followed by a rise.

Class I.—Records of 14 dogs showing a continuous drop during operation. Length of operation from 1½ to 4 hours. Operations included 11 laparotomies and 3 amputations:

	Temp. before ether.	Temp. at end of operation.	Length of operation.
1.	97.4°	94.0°	4 hours.
2.	98.4°	96.4°	3¼ "
3.	101.0°	94.0°	4 "
4.	96.0°	94.5°	1½ "
5.	103.0°	97.0°	2 "
6.	102.8°	94.0°	2¾ "
7.	101.2°	96.2°	3 "
8.	98.4°	95.0°	3½ "
9.	100.0°	94.5°	4 "
10.	100.2°	95.5°	3¼ "
11.	100.0°	94.5°	2 "
12.	100.5°	96.0°	2¾ "
13.	98.5°	94.5°	3¼ "
14.	98.0°	95.8°	2½ "
Average	99.7°	96.0°	3 "

Regarding the dog's normal temperature as 102.5°, the curve plotted for this class will be as shown in Chart III.

Comparing this curve with the curve obtained from morphia alone (Chart I), it will be seen that ether, administered at the lowest point of morphia curve, causes an additional fall in temperature. The morphia curve has reached its lowest point at the end of two hours, while ether given at this time produces a still further drop, averaging 3.7°.

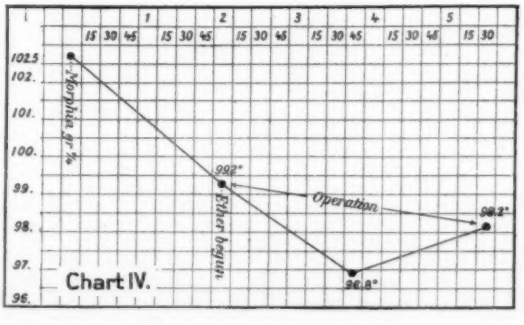


It is probable that these dogs did not all receive a full quarter grain of morphia, so the average fall produced by the morphia at the end of two hours is not quite as great as in the previous record—99.7° as against 98°.

Class II.—Records of 12 dogs, showing a drop after administration of ether followed by a rise to end of operation. Length of operations, from 3 to 5 hours, all laparotomies:

	Temp. before ether.	Lowest temp.	Length of falling period.	Temp. at end of operation.	Length of operation.	Point in operation at which rise began.
1.	101.0°	97.7°	2¼ hrs.	100.0°	3½ hrs.	Suturing stomach.
2.	97.4°	94.6°	1¾ "	96.6°	3½ "	Incision into stom.
3.	101.0°	97.8°	1½ "	100.8°	3½ "	Incision into peritoneum.
4.	98.2°	94.6°	1 "	96.2°	3 "	Incision into intestine.
5.	99.0°	97.0°	2 "	98.6°	3¼ "	.....
6.	99.0°	98.0°	1 "	100.6°	3¼ "	Incision into stom.
7.	99.6°	95.7°	2 "	97.0°	3¾ "	.....
8.	98.0°	95.6°	2¼ "	96.6°	3 "	.....
9.	100.8°	96.2°	1¾ "	96.6°	2¼ "	Closure.
10.	96.5°	95.0°	1½ "	95.5°	2¼ "	.....
11.	101.4°	97.2°	4½ "	97.4°	5 "	Closure.
12.	100.0°	98.4°	1 "	100.6°	5 "	Incision into stom.
Av.	99.2°	96.8°	1¾ "	98.2°	3½ "	

The curve obtained from these averages is as follows:



These figures show a drop after the ether is begun, just as in Class I. In from 1 to 2 hours, however, after the beginning of the ether, or from 3 to 4 hours after the morphia, the temperature begins to rise, this rise in some cases amounting to 3° above the lowest temperature, and averaging in all the cases 1.4° at the end of operation.

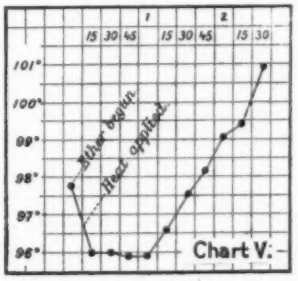
In attempting to explain this phenomenon the point in the operation which had been reached when the rise began was first considered, but as can be seen from the preceding table, these probably bear no relation to each other, since the rise may begin at any stage of the operation from the opening of the peritoneal cavity to the final closure.

The rise seems on the other hand to bear a definite time relation to the beginning of the ether, occurring between 1 and 2¼ hours after this in every case (except one, 4½ hours, for which a different explanation must probably be sought). As the morphia was given 2 hours before ether, the rise begins in from 3 to 4¼ hours after the morphia, or 3¾ hours on an average. Referring now to the morphia chart (Chart I) it will be seen that the morphia curve begins to rise between 3 and 4 hours after the administration of the drug, closely corresponding therefore to the time of the rise in the dogs under consideration.

The explanation, therefore, for this rise of temperature during the operation is probably to be found in the wearing off of the effect of the morphia.

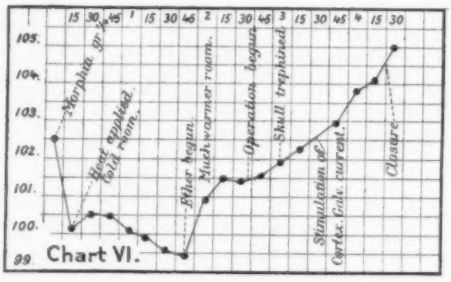
A comparison of the mortality figures of the 14 dogs in Class I and the 12 dogs in Class II shows that there were more fatalities among the former than among the latter. This would indicate that there is a better operative prognosis among animals, anæsthetized in this way, when this late rise in temperature occurs during the operation than when it does not.

Group IV. Showing the effect of morphia and ether, when the patient is protected by external heat and by coverings.—Having determined the nature of the temperature curve of animals under the influence of morphia and ether, the attempt was made to see how much this curve could be modified by applying external heat to the dogs while under the influence of the anæsthetics. The curves of two dogs, obtained under these conditions, are given. The heat was supplied from an electric heating-pad placed under the patients, and they were further protected by blankets.



Dog No. 1. (Chart V)—Operation, tracheotomy and thoracotomy with resection of rib. The heat was not applied in

this case till after the ether had been begun. The heat apparently had little effect for ¾ of an hour, after which the temperature began to rise, and an hour and a half later was 101°, a much greater temperature than that obtained at a similar stage from any of the unprotected dogs.



Dog No. 2. (Chart VI)—Operation, craniotomy and galvanic stimulation of motor area of cortex. The heat in this case was applied soon after the administration of morphia. The dog at first was in a cold room and the heat rather imperfectly applied. Under these conditions the body temperature still continued to fall, reaching 99.5° in 1¾ hours. At this time the dog was removed to the operating room, which was much warmer and where the heat could be more perfectly applied. The temperature at once began to rise in spite of the administration of ether, and steadily advanced to 105° in 3 hours, at the end of operation, or 2.5° above the dog's normal. In this experiment the stimulation of the cortex may possibly have had some effect through disturbance of the thermic centres, although the marked and abnormal rise is probably mainly due to the high surrounding temperature.

Conclusions.

I. The dog's normal temperature is between 102° and 103°.

II. Morphia, ¼ grain, at ordinary room temperature, causes a drop of from 3° to 5°, reaching lowest point in 1½ to 2 hours, remaining steady there for 2 hours more, and then gradually rising as the effects of the drug wear away.

III. Ether alone causes a fall in temperature, its extent depending largely on the surrounding temperature, remaining down during the administration of the drug, and rapidly rising to normal on its discontinuance.

IV. Morphia and ether in combination cause a greater drop in temperature than morphia alone, the average fall amounting to 6° in dogs under ordinary operating-room conditions.

V. The rise of temperature due to the wearing off of the effects of morphia may take place despite the fact that the dog is simultaneously under the influence of ether anæsthesia, or, on the other hand, the effects of the ether may be so great that no rise occurs.

VI. If heat be applied externally to dogs under morphia or ether the fall in temperature is much less, and if the heat be continued long enough, the temperature rises to normal or even above normal levels.

VI. Prognosis. In the dogs operated on under the conditions mentioned the prognosis seems better in large than in small animals, in males than in females, and in dogs showing a rise in temperature as the effect of morphia wears off. The amount of fall of temperature apparently does not affect the prognosis.

VII. The nature of the operation seems to have no definite bearing on the temperature curve.

XVII. A STUDY OF REVERSAL OF THE INTESTINE.

By R. D. McClure and H. F. Derge.

Normal peristalsis passes downward away from the stomach. Peristalsis may pass toward the stomach in certain abnormal conditions, as in isolated pieces of intestine or in the exposed intestine of living animals. Antiperistalsis, as has been pointed out by Cannon, normally occurs in the ascending colon, and these waves are even more frequent here than those normally directed.

The fact that reversal of peristalsis occurs after an obstruction and after stasis of the intestinal contents suggests that reversal of the peristalsis might entirely and permanently replace the normally directed peristaltic waves, if the exciting cause of this abnormality be maintained for a sufficiently long time, and still be compatible with the life of the individual.

Since the original investigations of Mall (1) and Halsted in 1887 many studies of intestinal reversal have been made, the results being largely confirmatory of those first obtained. In these early observations the animals rarely lived more than one or two months before showing symptoms of emaciation and intestinal obstruction. Mall found that the mucous membrane of the dilated portion of the bowel at the upper end of the loop was converted into fibrous tissue and that the muscular layers were much hypertrophied above the upper suture; also that the vessels passing to the reversed loop were all greatly widened and elongated, showing that the intestinal dilatation was accompanied by hypertrophy of all parts of the bowel and was not a simple mechanical distention. His observations led him to believe that under normal circumstances the vermicular action is always in one direction and away from the stomach. The accompanying photographs (Figs. 17, 18) from two of our cases show the gross appearances of the spindle-shaped enlargement which occurs about the proximal suture.

Kirstein (2) (1889) explained the dilatation at the upper end of the reversed loop by the meeting of the downwardly directed stream of the normal intestine and the upwardly directed one of the reversed loop. Nevertheless he was of the opinion that an antiperistaltic movement had taken place.

FIG. 17.—Showing reversed loop in situ, to give an idea of the relative enlargement of the distended and hypertrophied portion of the bowel. Proximal line of suture at *A*.

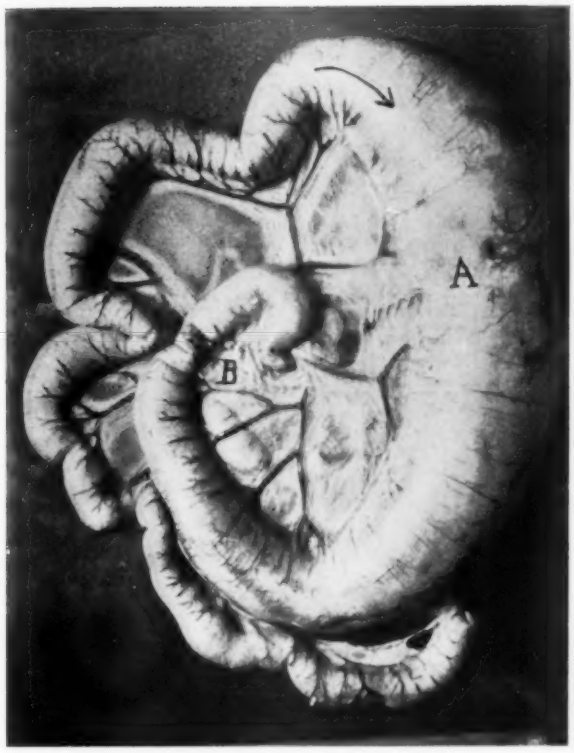


FIG. 18.—Showing enormous spindle-shaped dilatation on either side of the upper anastomosis, *A*. The point of greatest dilatation is 3 cm. above the suture on the normally directed intestine. Lower anastomosis of reversed loop at *B*, where lumen remains of normal size.

FIG. 19.—Showing character of impacted contents. Note great thickening of intestinal walls on section.
A. Proximal line of suture.
B. Distal line of suture.

Edmunds and Ballance (3) (1896) found that the reversed loop becomes considerably shorter.

Kauders (4) (1892) obtained the same general results with cats; but he found atrophy of the gastric and intestinal mucosa and a sac-like dilatation. While Mall's and Kirstein's observations agreed in attributing the dilatation to the pressure of the opposing peristaltic streams, Kauders attributed it to atony of the reversed gut.

Kelling (5) (1900) reported a case of reversal with apparently normal health sixteen months after the operation, and concluded that antiperistalsis had taken the place of the normal peristalsis.

Mühsam (6) (1900) reversed the entire jejunum and ileum. Although there were no survivals after this extensive reversal his observations led him to believe that antiperistalsis took place.

Enderlen (7) (1901) used the lateral anastomoses in his experiments instead of the end-to-end method. He performed a series of metabolism experiments and found that the food underwent normal combustion in the intestine. He believes that the vis à tergo does not entirely explain the passage of intestinal contents through the loop, but that there is also antiperistalsis.

In our series of experiments portions of the intestine varying in length from 12 to 75 cm. were reversed. The Connell method of end-to-end anastomoses, with an occasional reinforcement by a Halsted mattress suture, gave us an immediate operative recovery in every instance. On the day following the operation the animal would usually appear ill, but by the second day stools were passed, and after three or four days the appetite was good and there was a regular daily passage of fæces. In the first week diarrhœa was often present, but this soon subsided and the stools became normal in consistency. For a time the animal would remain normal in weight and general condition, but sooner or later signs of emaciation would appear with progressive loss of weight until the animal was chloroformed. This in one instance was 123 days after the operation.

We believe that the animals could be kept alive indefinitely with proper regulation of diet, for at autopsy the large spindle-form enlargements at the upper anastomoses were distended by impactions of solid materials, such as fragments of bone, hay, etc. (Fig. 19), forming an almost complete obstruction. The experiments of Mall, in which glass balls were placed in the food, but were not as a rule passed in the stools, show that solid, non-digestible masses do not pass through the reversed loop. The more soluble food stuffs, on the other hand, easily pass as is evidenced by the regular movements and by the contents of the bowel at autopsy.

That antiperistalsis can occur is evidenced apparently in clinical cases of intestinal obstruction by the fæcal vomiting, though in an obstruction high in the small intestine regurgitation might readily be caused by a strong general contraction of the gut above the obstruction, and by the pressure resulting from spasms of the abdominal wall. However, if the obstruction is low, antiperistalsis alone will explain the presence of intestinal contents in the stomach.

Cannon and Murphy (8) (1906) in their valuable paper on intestinal movements, have stated that it is "probable that a direct study of peristalsis in animals in which obstruction and stasis of food have been caused may prove that in such conditions reversal of the normal direction of peristalsis readily occurs."

We undertook at varying intervals after the reversal of portions of the bowel to make a direct study of the peristalsis, at the same time bearing in mind the statement of Meltzer and Auer that the mere opening of the peritoneal cavity tends to inhibit gastric and intestinal peristalsis. The animals under ether narcosis were placed in a tub of normal salt solution at a temperature of 37° C. and the loops of bowel allowed to float free. Small quantities of a 1 per cent pilocarpin solution were then injected intravenously.

In one of these observations, twenty-four days after the operation, active peristaltic waves would sweep down to the upper line of anastomoses, and then the mere suggestion of a wave would pass on down over the loop. A fairly distinct wave would occasionally start up the loop, though at no time was the peristalsis as active in the loop as in the normal gut. There was evidently a local disturbance of the peristaltic activity. Similarly, in another case, eighteen days after the operation, with twenty-eight inches of bowel reversed, a peristaltic wave beginning 6 cm. above the upper anastomosis would seemingly stop at the line of suture, and be followed by a feeble movement which would continue from the upper anastomosis down toward the lower. Pinching of the loop started waves which passed downward, but they were more sluggish than those started by a similar stimulus in the normally directed intestine. Thus downward peristalsis in the loop was at all times less definite than in the remainder of the intestine.

In another experiment a wave would pass down to the upper line of anastomosis, where, stopping abruptly, it would jump to the lower line of anastomosis and pass upward along the loop.

In one series of observations the large intestine, in which antiperistalsis normally occurs, was reversed. These animals invariably developed peritonitis, although at autopsy the reversed loop was found in each case to be perfectly healthy and the suture intact. The infection was due to necrosis and sloughing of the portion of the rectum between the lower line of anastomosis and the anus, in which vascular anastomoses evidently were insufficient to maintain life in the short terminal portion of the bowel not reversed. To obviate this we hope to completely excise the lowest portion of the rectum which cannot be reversed, and bring down the lower end of the reversed loop and suture it into the anus.

In concluding, we agree with Kirstein that some antiperistalsis does take place, but we believe that the propulsion of the fluid or semi-fluid contents through the loop is partially caused by the strong contraction of the hypertrophied portion of the gut adjoining the upper suture. The contents are thus forced

well down into the loop, whence their fluid portion is carried onward through the reversed segment by antiperistaltic waves, whereas the more solid portion is carried back up into the dilated part of the gut by the normally directed waves.[1]

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Prutz and Ellinger: Ueber die Folgen der Darmgegenschaltung, Archiv. f. klin. chir., Vol. LXVII, 1902, p. 964.

[1] The paper of Edwin Beer and Carl Eggers (Are the Intestines Able to Propel their Contents in an Antiperistaltic Direction?—Annals of Surgery, Vol. XLVI, p. 576, October, 1907) has appeared since the writing of these notes. From their observations of the behavior of reversed loops, they are convinced "that the small and large bowels are capable of propelling food in an antiperistaltic direction." "Early in the life of the reversed loop, there seem to be ana- and katastaltic waves; later on the katastaltic (which are antiperistaltic with reference to the original normal bowel) seem to predominate."

Their conclusions are in accord with our own and serve to strengthen the view that antiperistalsis does occur, though we believe that the vis à tergo does play more part in forcing the contents through the loop, or at least well down into the loop, than they attribute to it.

XVIII. PRIMARY SARCOMA OF THE HEART IN A DOG.

By CARL HERBERT BRYANT.

Owing to the great rarity of tumors of the heart, especially of those forms which are not of metastatic origin, the accidental finding of such a growth seems worthy of record. Particularly in dogs do cardiac tumors seem to be uncommon, and in the available literature we have found no recorded cases.

A large bulldog, a vagrant animal apparently in vigorous physical condition, died under ether anæsthesia early in the course of an abdominal operation for a hypothetical lesion. A somewhat vicious animal, he had been kept under close surveillance during his several days residence in the laboratory, and there were no indications from his behavior that he was ailing in any respect. No auscultatory examination of the heart and lungs had been made.

In view of the fact that in a number of instances of sudden death under anæsthesia in the Hunterian Laboratory the cardiac failure had been associated with the presence of Filariæ in the heart and pulmonary vessels, it was anticipated that these parasites might be found in this animal at a post-mortem examination. A careful autopsy, however, resulted in negative findings other than the lesion to be described. A painstaking search for a possible primary focus of malignant disease failed to reveal any abnormality whatsoever in the visceral or in the skeletal structures. Though the usual intestinal parasites common to canines were present there were no Filariæ.

At the base of the heart, lying practically on the inter-auricular septum, at the root of the large vessels, is a roundish, slightly lobulated tumor about the size of a chestnut (Fig. 20). It is largely concealed by the left auricular appendage (lifted up in the photograph) and fits snugly in between the pulmonary artery and aorta without infiltrating their walls. It

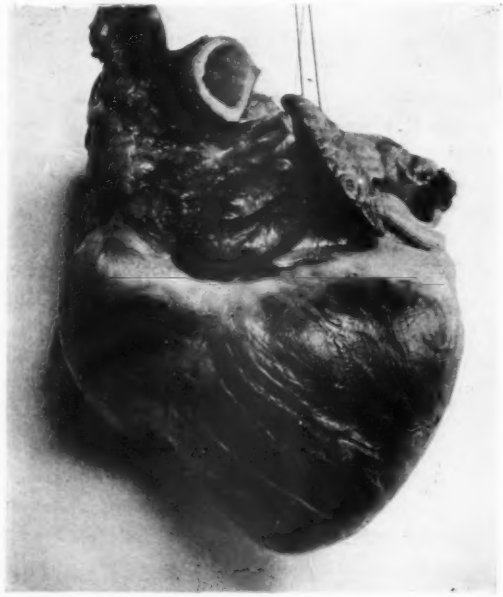

FIG. 20.—Photograph of tumor, from which block has been cut for microscopical examination. Left auricle lifted away from its normal position, in which it largely concealed the tumor.

extends around behind the aorta until it touches the base of the superior vena cava. The growth measures 3.5 x 1.8 x 1.3 cm. in its various diameters, the longest diameter being situated antero-posteriorly. The growth is firm, sessile, and its surface is covered by glistening epicardium. Its blood supply is abundant.

On section the surface is smooth, gray, yellowish-red in its more vascular areas, somewhat translucent, and fairly homogeneous in structure. It nowheres infiltrates the subjoining structures and evidently originates in the sub-epicardial connective tissues.

Microscopical appearances.—The tumor proper is surrounded by a fairly thick layer of vascular connective tissue. From this capsular layer interlacing bands of fibrous tissue pass into the growth, partitioning it into lobules of variable size. In a few areas there seems to be some proliferation of the spindle cells of these septal strands, but otherwise the tumor consists of alveoli of round cells, reproducing the small round-celled sarcoma in its pure form. The cells are of medium size with large, deeply staining nuclei. In most places the groups of cells are alveolated by the fibrous septa, but in some fields there are diffuse areas where there is only a delicate intercellular network with a few thin-walled blood-vessels. The cells are nowhere pigmented.

Thus the tumor presents the structure of a typical round-celled sarcoma. The heart was otherwise normal. There are no endo- or myocardial changes and evidently the growth had not reached a sufficient size to cause any functional disturbances from vascular obstruction.

The literature concerning tumors of the heart deals almost wholly with those which have occurred in man, though we have found occasional references to their disclosure at autopsy in the hearts of herbivorous animals. The tumors, in a large proportion of the recorded cases, have been secondary to disease elsewhere. In the Index Catalogue of the Surgeon-General's Office, 1st Series, 1884, Vol. V, under tumors of the Heart, are references to about 90 papers. In Vol. VI, 2d Series, 1901, under the same heading occur references to 52 papers in the intervening seven years. These, for the most part, are records of isolated cases, and with but few exceptions describe metastatic tumors. From this the rarity of primary growths may be inferred, and the following figures serve to show that the relatively more common secondary growths only occur in 3 per cent of hospital cases which have had post-mortem examination.

In a record of 4547 autopsies Arthur Willigk (23) in 1856 found 16 cases of cardiac cancer, 9 involving the heart itself and 7 the pericardium. All were secondary and they represented the proportion of cardiac metastases in 477 cases of carcinoma originating in other parts of the body. At the time of his report he found reports of 5 cases of sarcoma and 4 of epithelial tumors (two being melanotic) of the heart. Similar statistics were given in 1874 by Ely (8), who found among 2161 autopsy records in the Georg Hospital during ten years, 7 cases of cardiac tumor, all being secondary carcinomatous metastases. Dr. MacCallum has kindly given us the following figures from the Pathological Department of The Johns Hopkins Hospital: In 2942 autopsies there have been 10 tumors of the heart, all secondary with the exception of one rhabdomyoma. They are divided into 1 sarcoma, 1 lymphosarcoma, 2 epitheliomas, 1 endothelioma, and 4 carcinomas.

Bodenheimer (4) in 1865 gave figures in regard to the position of the metastases, showing that the muscular walls are most commonly affected and with about equal frequency on the two sides. In a few cases, however, the pericardium alone was involved. He explained the variable symptoms which had accompanied the growths as purely mechanical effects of their presence; namely, the precordial pain, palpitation, sense of oppression, dyspnœa, cough, hemoptysis, cyanosis, œdema of the extremities, effusions into the various serous cavities, giddiness, syncope, attacks of unconsciousness, etc.

Fränkel (10) in 1889 collected reports of 17 cases of primary tumors published between 1876 and the date of his writing. To this list Bertenson (3) in 1893 added 13 more cases, 8 of them antedating Fränkel's paper, having been overlooked or purposely not included by him. Among them was Bodenheimer's (4) case of primary sarcoma reported in 1865.

Of Bertenson's 30 cases of unquestioned primary growths 9 were sarcomata, including 3 described as fibrosarcoma and 1 as a myxosarcoma. The others were divided between fibromata, carcinomata, lipomata and cysts. The situation of the growths was as follows: 7 were in the right auricle; 3 were in the right ventricle; 7 in the left auricle; and 5 in the left ventricle; 2 occurred in the sheath of the auricles; and 2 in the sheath of the ventricles.

Tedeschi (9), also in 1893, estimated that 80 cases of primary tumor had at that time been recorded, but it is probable that he included some which were possibly of metastatic origin.

Petit's (18) exhaustive report (1896) deals interestingly with the historical aspects of the question. According to him the first recorded case of "tumor" was a cyst described in 1767 by Lieutaud. Ely (8) believes, however, that the majority of the earlier reports, many of them indefinitely described, were likely enough thrombi rather than true neoplasms. Petit says the first authentic lipoma was described in 1855 by Albers; the first fibroma by Luschka; the first myxoma by Lonne in 1869; the first parasitic cyst by Dupuytren in 1871, and the first sarcoma by Deffaux in 1872. According to Wolbach (24) the first authentic rhabdomyoma was reported by v. Recklinghausen in 1863, and in his recent paper he adds one more to the 11 previously recorded instances of this rare form of primary and congenital tumor.

Of the primary sarcomata a few of the more important cases have been published by Gross (11), Jacobi (14), Fränkel (10) and Hektoen (12). Hektoen's case possesses a remarkable similarity to our own, although the tumor was large, had spread over a large part of the heart and had increased in size to the point of embarrassing cardiac action. It, however, had apparently originated from the subepicardial

tissues and was practically of the same histological picture as this tumor which, in a much earlier stage of its growth, we have found in a dog.

More recently reports of cardiac sarcomata have been made by Leroux and Meslay (16), Lambert (15), Bernheim (2), and Raw (19). Raw refers also to cases of Zander, Hottenroth and some others. Other cases have been included by Ricketts (20) in the bibliography following his paragraphs on sarcoma of the heart. Among them are cases by Sterling (21), Thacher (22), and others which were probably metastatic in origin.

Of the many cases that have been reported, the pathological conditions were those of the terminal stage of the disease, and consequently the growths had advanced to such a point that it was difficult to determine exactly where they had originated, whether in the pericardium, in the epicardium, at the base of the heart or elsewhere. In our case the accidental finding of a small tumor in the situation described may possibly shed some light on the common source of origin of primary sarcomatous growths.

Summary.—Tumors of the heart are rare, primary tumors especially so. Almost without exception the recorded cases have occurred in man and have led to death in consequence of great vascular stasis. The tumor in the present case—a primary epicardial round-celled sarcoma, an accidental autopsy finding—had led to no functional disturbances. We believe it to be the first recorded case of primary tumor in the heart of a dog.

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XIX. NOTES ON THE RESECTION OF LARGE PORTIONS OF THE SMALL INTESTINE.

By HERBERT M. EVANS and A. G. BRENIZER.

Those who have followed the history of intestinal resection will remember that only a few years ago the successful excision of many inches of the small intestine was a matter of comment and unusual interest.

The early experiments of Senn (1), however, clearly showed that about a third of the intestine could be removed without danger either to life or to nutrition, and eventually, in 1899, Dreesmann (2) was able to collect some 27 successful clinical cases in which over a hundred centimeters of the intestine had been resected, two of them, indeed, exceeding three hundred centimeters—the celebrated cases of Fantino and Ruggi.

Since Dreesmann's publication some eight or ten resections of equal extent have been recorded, so that his list must be increased to at least 35 authentic cases[1] in which over a hundred centimeters of the small bowel have been successfully removed.

Step by step with the increasing success of enterotomies in surgery, valuable experimental work in continuation of Senn's researches have given us truer ideas of the possibilities of successful resection in animals. Thus, as a result of his observations Trzebicky (3) was convinced that animals would tolerate the removal of more than a third, and, as is well known, Monari (4) has declared that the limit may be still further extended to seven-eights of the small intestine; for in an animal with this great fraction removed he found no important interferences with metabolism. Observations made by Flint[2] in 1900 are of even more significance in this respect than Monari's single successful case, for three animals, upon which resections of 70, 82 and 83 per cent respectively had been performed, were alive many months after the operation.

Thanks to the investigations of De Filippi (5), Plaut (6), Riva Rocci (7), Sagini (8), and Erlanger and Hewlett (9), we are now aware that we need fear no serious embarrassment in the digestive or assimilative powers after such resections, if due attention be paid to the amount and kind of food; for practically all are agreed that the only impairment in such cases is in a diminished power of fat absorption. Whether this loss, dependent on a diminished area of absorbing lymphatic radicles, may not ultimately be largely regained through hyperplasia of the mucosal lymphatics remains as yet unknown.

The recovery from such a tremendous loss of secretory and absorptive surface has been made more intelligible to us by the demonstration of a compensatory hypertrophy of the intestinal wall, which follows these operations—a hypertrophy first noticed by Senn, but not thoroughly studied, so far as we are aware, by anyone but Flint, whose results are as yet unpublished.

Our own resections were undertaken with quite another object than that hitherto sought; viz., to study the essential vascular changes in the hypertrophy following resections—an investigation begun by one of us in the laboratory of Professor Mall. Quite apart from such interests, our operations have taught us certain things not only in regard to the possible limits of resection, but also as to the behavior of the animals under investigation, and owing to the few observations in this field these facts are here set down.[3]

Before the very extensive operations were attempted a number of lesser resections were made. Excluding the few cases in which peritonitis supervened these animals invariably survived. In four of these successful cases 33, 37, 41, and 50 per cent respectively of the mesenterial intestine was removed. The animals behaved alike in all essential respects, so that the relation of one case, No. 4 in our series, will suffice to illustrate the subsequent history of all:

Protocol, No. 4. White male dog with black spots, weighing 21 pounds and apparently in the best condition. On November 27, 1906, the abdomen was opened under ether anæsthesia near the outer border of the rectus. At a point 42 cm. from the duodenojejunal flexure a piece of intestine 105 cm. in length was resected. On measurement just 105 cm. of gut were left in the distal piece, so that the entire mesenterial intestine was 252 cm. in length (measurements were made with a piece of cloth, the length of which was used as a unit and afterwards accurately measured). The distal and proximal ends of the gut were then inverted and a lateral anastomosis was made. The abdominal wound was closed in layers. The dog made an uneventful recovery.

For twelve days the animal was fed three times daily on milk and pulverized crackers. The wound healed per primam, and on the fourteenth day the animal was turned out into the general yard. Here, though he undoubtedly got more than his share of the daily meals, he grew progressively thinner. On one occasion we confined him again in his cage, forcing the food in the hope of increasing his weight, but this made little appreciable difference and by the end of the twenty-second post-operative day he had become greatly emaciated. His thin appearance, however, was in strange contrast to his persistently voracious appetite and general spirit and activity.

For the first five days there were traces of blood in the stools; the movements subsequently became soft and mushy in consistency. Occasionally, lasting for a day or two, a troublesome diarrhœa would appear, but this was infrequent.

After the twenty-third day our records showed no further diminution in the animal's weight. There followed a gain in weight, which manifested itself without increase or change in any way

[1] These have been collected mainly from those listed in the Catalogue of the Surgeon-General's Library (New Series) and from the Index Medicus.

[2] Metabolism experiments on these animals were reported by Erlanger and Hewlett. Professor Flint has manifested the greatest interest in our experiments and has most kindly aided us by his suggestions.

[3] Most of our operations were done in conjunction with Dr. L. L. Reford, to whom is due not a small amount of what measure of success was attained.

in the diet, and was a constant feature from that time on. He always appeared to be the healthiest and most active animal in the paddock. His appetite was tremendous and he would often bolt down quantities of food, as though fearful of not getting his share of the provender if more time were taken. He would often keep his companions from the food, and was so vicious in this regard that he became extremely objectionable in the yard.

On April 10, 1907, 134 days after the resection, the animal was chloroformed and autopsied, in order to study the changes which had taken place in the intestinal tract. We found much of the abdominal cavity occupied by an immense loop of bowel, which showed at many points the fine black interrupted sutures of our old anastomosis, demonstrating that the hypertrophy, which was remarkably local, had occurred chiefly in the neighborhood of the anastomosis. On either side of the hypertrophied portion of bowel, which assumed a spindle-shaped form, the enlarged bowel rather abruptly narrowed again to its normal size. Measurements above and below the seat of anastomosis showed little change in length from the records made at the time of operation.

In the accompanying charts the ordinate values represent weight (a pound being the unit), while the abscissæ represent time (a period of two days being the unit). The chart plotted for this animal (Chart 1) gives the typical behavior in these cases. The rather speedy emaciation and then gradual increase in weight are plainly marked and the same thing occurred in the case of each individual of the four. The others, however, were more tardy in again attaining their normal weight. Since we did not autopsy animals at varying periods it is impossible to say that the beginning of the rise in weight marked the beginning or achievement of a certain amount of compensatory regeneration, though this is not improbable.

The more extensive resections with their outcome may be briefly tabulated as follows:

Animal No.	Length of mesenterial intestine.	Length resected.	Percentage of intestine resected.	Ultimate result.
6	250.5	168	76.1%	Recovery.
10	189.0	160	84.6%	Recovery.
11	170.0	147	86.5%	Death in 30 days; definite evidence of "hypertrophy."
13	182.0	159	87.3%	Death in 51 days; little or no evidence of "hypertrophy."
9	263.0	242	92.0%	Death in 97 days; no evidence of "hypertrophy."

The weight curve during recovery from such extensive resections is equally well illustrated by that plotted in the case of Animal No. 4. It is to be observed (Chart 1) that the rather rapid emaciation is not succeeded by a really persistent gain until well after the 28th day. The gain is decidedly gradual and in the case of No. 10 many more weeks were consumed before the normal weight was approached.

Animals Nos. 11 and 13 showed considerable difference in their resistance to the resection, for, though originally of the same weight and receiving the same post-operative treatment, the one emaciated rapidly and the other much more gradually.

Animal No. 9 in the series (Chart 2) from which over 92 per cent of the free intestine had been removed with perfect and immediate recovery, was followed with the greatest interest. The animal, considering its size, was very fat—a factor which no doubt contributed largely to the long resistance to marasmus which showed in a post-operative life of over 97 days. She had always been active and had eaten well from the second day after the operation. The decrease in weight—not so rapid as in other cases—continued in spite of several periods of special feeding which we enforced. Except for two marked, but temporary oscillations, shown in the chart, the fall in weight was constant, though more gradual as the weeks passed.

Conscious that the animal had already shown a post-operative life in excess of any previously reported after so great a resection, we were in hopes of staying the emaciation for a length of time sufficient to afford ample opportunity for intestinal hypertrophy. With appetite, good spirits, activity and every appearance of health save a profound emaciation the animal at length died. Only for the last three or four days did she exhibit any evidence of weakness or signs of physical illness.

At the autopsy no more remarkable instance of atrophy could possibly have been presented. Not only were there no evidences of a hypertrophic response in the gut, but all of the organs and notably the liver and spleen had diminished to a small fraction of their normal weight and size. Microscopic examination showed pictures everywhere of cell shrinkage and destruction with an accompanying accentuation of the connective tissue framework.

It is clear that in this case we had exceeded the limits of successful response. In the other cases it may fairly be said that bountiful overfeeding for many weeks and months might, in all probability, have changed the eventual outcome. If our short experience has taught us anything, it would emphasize the necessity for abundant nourishment and the best hygienic surroundings and care. With these precautions animals will surely survive resections in an amount heretofore not thought possible.

A word may be said concerning the hypertrophy found in certain of the cases just described. We were much impressed by the findings after certain other operations upon the intestine done in this laboratory during the last year. Thus, in the obstruction produced after the reversal of a loop of the small gut we saw a dilatation remarkably like those in our own cases. The excellent figures of a typical one of these reversal cases given by McClure and Derge (Figs. 17-18, Pl. XLVIII) might serve equally well to illustrate our own findings. It is significant that in both cases one finds an hypertrophy of the intestinal wall. These things lead to the consideration of whether we could not explain the great changes in the intestine as a result of a certain amount of obstruction which our anastomosis necessitated. Against such a view, we have found little food in the distended bowel, not, indeed, anything indi-

cating an obstruction. So striking, however, was the similarity of the autopsy conditions in these cases that we must now institute careful controls in which a series of anastomoses without resection can be studied after a considerable post-operative life, and in other cases we must study similarly the effect of slight obstructions.

In conclusion it may be said that, excluding surgical mishaps, animals undoubtedly can invariably survive the loss of a third of the small intestine and practically always the loss of half.

With the best of care many will tolerate a removal of two-thirds, and some, as Monari's, Flint's, and our own observations indicate, will recover from a resection of almost seven-eighths of the mesenterial intestine. This, however, certainly approaches the limit of subsequent compensatory hypertrophic response.

What is meant by recovery may well be defined, for a post-operative life for any period of days or weeks can not be a criterion; nor can an external appearance of activity and health, judging from our own experience. For example, Animal No. 9 in our series was in no sense a "recovery," though it survived the operation for almost a hundred days with no evidence of weakness or ill health until shortly before death.

A return to normal or nearly normal weight may be delayed for many months, and it is only when this is approached that we may justly speak of true recovery. Even though in some of these cases there may remain a tendency to diarrhœa and a need of careful regulation of the diet, these observations furnish us nevertheless with astonishing examples of the compensatory powers which the body possesses in adjusting itself to abnormal conditions.[1]

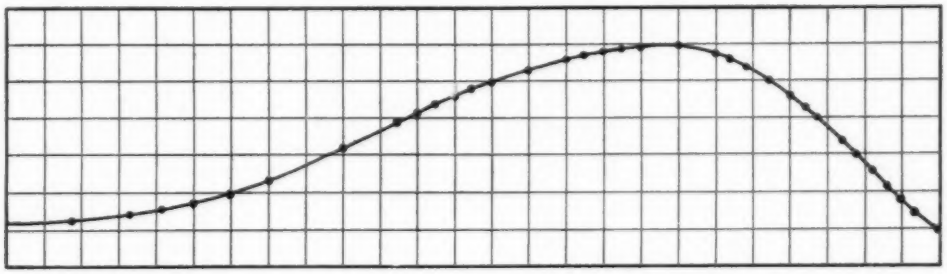

CHART 1.

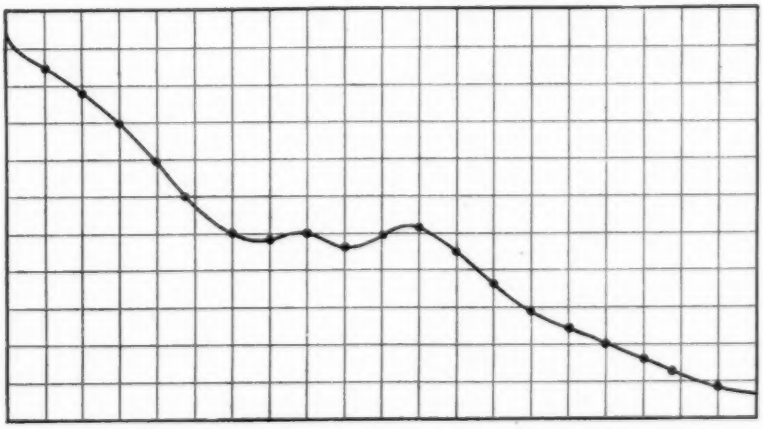

CHART 2.

[1] There was one peculiarity of these animals not mentioned by the writers which struck me most forcibly; namely, the astonishing change in their disposition. Animals previously amiable and friendly, after these resections would often become belligerent and ferocious to a degree. When allowed to run free in the paddock they would without provocation attack any animal they encountered, regardless of his size; and they were oblivious to punishment. One of them killed a number of other and larger dogs, so that he had to be muzzled, and if the chance offered would fearlessly attack them even when thus handicapped. Indeed, we thought that this restless activity played not a little part in keeping the animal thin. It undoubtedly represents some psychic consequence of the disordered nutrition. I am told that somewhat similar characteristics may appear in animals after the establishment of an Eck's fistula, when they are allowed to have a proteid diet. I have never seen a change in disposition result from any other operation, except the direct removal of the frontal lobes.—*H. C.*

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THE PHYSICIAN IN THE PAINTINGS OF JAN STEEN.

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The paintings of Steen date from that period of intellectual activity which we may roughly describe as the seventeenth century; and some contemplation in retrospect of the setting in which they were produced must needs be undertaken if we are to bring to them and to the man who painted them the interest and appreciation which both deserve. Though the story of those days is never quite a stale one it is of course an ancient tale; and this difficult task of leaping the years is one, I dare say, we usually do awkwardly enough. But it so happens that sufficient facts are at hand to enable us to construct a fairly satisfactory picture of the age in question. We are well aware what, in a general way, those facts are, and the term Renaissance, under which we group them together, is a hackneyed one; yet I imagine we seldom clearly appreciate and can indeed hardly exaggerate the buoyancy, the elation, the zest, the new interest in life which characterized those days and led, in the end, to all those results now spoken of in a more or less off-hand way. We are wont to proclaim the strides which Progress, shod in her seven-league boots, has made in our own days; and to point with pride, for instance, to the infinite distance she has travelled from Jane Austen to Henry James; but consider for a moment a few of the achievements of the seventeenth century which indicate the extent of general interest in natural science and the scientific method, as well as the importance of medicine. These were the days, for instance, of the births of academies: the College of Invisible Philosophers dating from 1645 and to be christened the Royal Society when it came to term, the "Académie des Sciences," the Experimental Society, and others in Italy. These were the days of philosophers of the first rank: Bacon, Locke, Descartes, Spinoza. They were the days, too, of new scientific appliances, like the microscope of the Jansens of Holland. And as for scientific discoveries, the times teemed with them—ranging all the way from the discovery of the circulation of the blood to that of the site of cataract. You have indeed but to name over some of the medical men of this time to remind yourself how lively must have been the medical interest and enthusiasm. Borelli, Malpighi, Bellini, Harvey, Glisson, Wharton, Willis, Cowper, Vieussens, Brunner, Bartholinus, Pacchioni, Sydenham, van Helmont, Mauriceau, Chamberlen—even so incomplete a catalogue as this suffices for the purpose. You must, indeed, think of the men of these renascent days as fired with enthusiasms which make those of even our own somewhat spirited times look jaded. You may imagine them facing the new world which had just been handed over to them for their very own with all the rejoicings of strong men about to run a race, or the chafing eagerness of war-horses scenting the battle; but perhaps thinking of them as children before the nursery door on Christmas morning gives you as good a picture of the facts as any figure can. The nursery, every one knew, was full of treasures—could they not indeed hear the tables creaking and groaning under the good things? And could they not imagine the feast spread in the rooms beyond, the feast that would end with Harvey's "divine banquet of the brain?" No wonder, knowing as they did where the door was and how to open it, after the long night from which they had just awakened, they fretted to be within. No wonder, too, that once in the store-house of treasures a hubbub arose—inordinately boisterous laughter, whinings, bickerings—each child forgetting his manners, forgetting his neighbors, forgetting, in his excitement, everything but the enthusiasm of new delights, the joy of new possessions. You could scarce hear yourself think for the squabbling of the Iatrophysicists and the Chemiatrists; van Helmont ran to and fro shouting for everyone to look at his "Archeus"—a man-like toy that walked and talked without winding; and Descartes and other Gallic children, with all the zest and with some of the petulance of little boys, tried to get Harvey to throw away as worthless one of the treasures on which he had written his own name.

It was over the Netherlands, among other places, that the new spirit chose to brood and here it was that some of the greatest results were achieved. The little countries were, as it happened, sharing with Italy, France and England an immunity from a struggle then raging on the Continent; and freed from the demand of war they yielded to the soft call of

FIG. 1.—Love-sick Lady, or The Doctor's Visit (Smith, No. 118); now in the Mauritshuis, The Hague; restored thither from the Louvre in 1815; until 1763 belonged to the Collection Lormier; until 1771 belonged to the Collection Braamcamp.

FIG. 3.—Der Wunderdoktor—The Rijks Museum, Amsterdam.

FIG. 2.—The Quack Doctor (Smith, 47); now in the Rijks Museum, Amsterdam; until 1763 belonged to the Collection Lormier.

the arts of peace. Here the incisive author of La Méthode had chosen to live; here Spain's God-intoxicated philosopher was raising his voice to a world that later was to pause, to listen, to ponder, and to bow the knee; here Huyghens was teaching the clocks of the world to tick out the name of Holland to eternity. And if we turn to medicine we find the little folk as industrious as ants. Here was Boerhaave becoming, as Haller called him, the teacher of Europe (communis Europæ præceptor); here was Beverovicus of Dordrecht, the first physician to come out for Harvey; here were Sylvius, of cerebral fame, and the Jansens, inventors of the microscope, and de Graaf, discoverer of the follicles, and Nuck the anatomist, and Ruysch, and Swammerdam, and Leeuwenhoek.

It was, as it happened, in the industrious little Netherlands during those enthusiastic times, that one of the great schools of painting sprang up; and it is interesting to trace with Monsieur Taine, who applies to painting the same method that he used for literature, with equal brilliance, though with no less exaggeration, the characteristics of this school from the nature of the people among whom it came into being. They were, we are reminded, essentially a Germanic race, lacking in their features sculptural nobleness and dignity and in their minds finesse and precocity. They were voracious, carnivorous, addicted to drunkenness, sluggish and torpid in impression and movement; "stiff", says a Toulousian in criticism of them to M. Taine, "stiff, frigid, with no sensibility or sentiment, dull and insipid, perfect turnips, sir, perfect turnips." In Italy, in France, on the other hand, people were precocious, witty, but only moderately capable of biding their time, of self-subordination, of maintaining order. It is an Italian noble lady, for instance, who exclaims on eating a delicious ice-cream, "What a pity there is no sin in it!"; and it is a French lord who says of a roué, "Who wouldn't admire him, he's so wicked?" The defects of Germanic wit have, however, their strong points. The Germanic peoples are housekeepers who love their households; they are the great laborers of the world; they are able to accommodate their tranquil mind to comprehending things and directing them. The great natural difficulties of their lands they are able to overcome, turning Belgium, an alluvial expanse, and Holland, a deposit of mud surrounded by water, from being dwelling-places for storks and beavers into habitations for man. And these struggles, together with those against the unpropitious soil and rigorous climate end in making them excel in the useful arts, but in being deficient in profound philosophy or elevated poetry. All this produces good sense, somewhat limited; happiness, somewhat gross. "A Frenchman would soon yawn over it, but he would make a mistake; for this civilization, which seems to him unctuous and vulgar, possesses one sterling merit—it is healthy; the men living here have a gift we [the French] lack the most—wisdom, and a compensation we are equally undeserving of—contentment."

You do not need to accept all that M. Taine says or to follow him in such absurd details as the effort to make the rigorous climate of the Netherlands responsible for the absence of the nude in Dutch art, to realize that the contrast he draws between the German and the Latin races is well drawn and that in a general way the characteristics he speaks of did come out in the painting of the Dutch.

We are prepared by this time to expect that a school of painting flourishing in the seventeenth century should show some definite reflection of the scientific and medical interests which were taking such a prominent part in the thought of these days and of these peoples; and this is in fact the very point I wish to make. You will think at once, of course, of the famous, the almost hackneyed, Rembrandt, "Die Anatomie," but I refer you, by way of preface, to the less-known dissection of the head by the same painter; to the splendid "Anatomische Vorlesung," by de Keyser; to the "Anatomies," of Bäcker, of Van Neck, and of Pietersen; to the "Surgeon's Guild," of Quinckhard; and to other similar pictures, fifteen of them, now in the University of Amsterdam. I do not think, however, that these pictures so much represent the interest of the painters in medicine as they do speak for their large duties as portraitists; and it is to the school of little Dutchmen we must turn—little only by comparison with their great contemporaries—to see Dutch medical painting as a reflection of Dutch life and interests.

These "little Dutchmen" were a most interesting group of men. They were perhaps among the first to paint an entire picture from nature. They practically had no studios and they got along without models. They were, many of them, tavern habitués to whom nature appeared excellent. They were satisfied with mere living. They did not paint subjects as curious or interesting specimens, nor charge landscapes with the subtleties, refinements and emotions of poets. They were, I should venture to say, realists—though without any conscious theory of the thing. They moved among the people, painting what interested them just as they saw it. And it happened that what interested some of them greatly—Dou, Ostade, Teniers and Steen in particular—was the medical life they saw about them. It is of the last of these four that I wish to speak in detail.

The facts of Jan Steen's life are paltry enough. 1626, the year of Bacon's death, brought him into the world, nine years ahead of Rembrandt. He began the study of painting under Knüpfer at Utrecht; pursued it under Ostade in Haarlem, and finally at the Hague under van Goyen—marrying the latter's daughter in 1649. He had some not very distinguished residence at the University of Leyden, where culture made of him, as Holländer puts it, a "genius of brawling, drinking and painting." In 1672, having meanwhile had a somewhat precarious career on the financial side, he opened a tavern at Langeburg, near Leyden; one year later he married for the second time; and in 1679 he died. His pictures were evidently not highly esteemed during his life; they brought low prices, were probably given by him in exchange for liquor, and were to be found in almost every liquor shop and cabaret in Delft. There was hardly anything in this commonplace existence—and that it was a vulgar existence, too, there is strong tradition, though the portraits of him belie the story that he was a common drunkard—to account for a notable artistic

career; yet such a career he had. He was a painter, beyond doubt, of very great power and he had fortunately in his youth refined friends—among them Mieris and Metsu. Steen was not a satirist, in the sense that Hogarth was a satirist, for he made vice attractive by beautiful workmanship. He was capable of the very best; but he frequently painted in a slip-shod manner (probably after drinking); and his later work is often vile in subject, generally vulgar and loose, and slovenly in execution.

I can find no specific cause for the way in which medical subjects appealed to him. He painted, in all, about 315 pictures, and about 32 treated of the physician in one or another of his activities. Even Teniers, who was also partial to these themes, came nowhere near this proportion—painting, out of a total of 685, only about 30 medical pictures.

It is of course of particular interest to see just what features of the medical life appealed to this genre painter. We are not surprised to find him attempting nothing so ambitious as some of the great anatomies. His taste was as a rule not so elevated; he found no pleasure in conventional groups; and the small humorous canvasses which he left behind (they are usually not over 2 ft. square) were the work of a humorist, a genre painter who might excel only on condition that he take his limitations into account. It is fortunate that his taste did lead him to take them into account, and that he did not burn his artistic wings by soaring too near the sun—a fate that Hogarth, the "English Steen," did not wholly escape.

I am rather surprised first of all to find no blood-letting scenes among the Steen paintings I have seen, nor so far as I am aware among his pictures at all. The practice was surely rampant nor was the subject entirely neglected in art (for instance, two pictures by Brekelenkam and Van der Neer); yet Steen, with all his zest, seems never to have cared to "catch" it. He showed, on the other hand, an overweening, an inordinate interest in a certain form of neurasthenia; and ten "Love-sick Ladies" appear among his paintings. I think likely, too, from the accessories in some of his other works entitled "Sick Lady" or "The Doctor," etc., that he meant to indicate the grand passion as an etiological factor here too. (See the Cupid in pictures 10 and 11.) He usually indicated his meaning by some detail of these paintings (as in the "Rape of the Sabine Women" on the wall of his "The Love-sick Lady"—picture 1); and he either painted them with the refinement and finish of his early life (pictures 1, 9, 10, and 11), or in the more vulgar mood characteristic of his later days (picture 7). Sick ladies in general seem to have found a weak spot in Steen's heart. One grows quite used to the pathetic seated figures, dressed in ermine-bordered sacks —often brilliantly colored and models of taste beside the hideous things that go by that name to-day; to the silk skirts, again often brilliant; to the lovely heads, the sickest of eyes, and an appealing look that none but a boor could resist; to the stately physician taking the pulse as though he were dancing a minuet; to the rich Turkey rug, and the Cupid, and the dog, and the patient's fond mother, and the other accessories.

When we come to ask how these Dutch painters were impressed by disease and its treatment we are not surprised to find a strong emphasis laid on the physician as urologist. One gathers indeed from these pictures that the urine and the diseases of its organs were the chief practical concerns of the medicine of the day, and that diagnosis consisted in courtly palpation of the pulse and a wise look at a urinal. We have, of course, evidence from literature that the facts were not far otherwise. You will remember how the host in the "Merry Wives of Windsor," addressing Dr. Caius, cries out, "Thou art a Castilian, King Urinal!", and a little later in the same scene addresses him as "Monsieur Mock-water."[1] You will also recall in what terms the page of Falstaff brings him his bill of health from his physician. "Sirrah," says that man of war, "you giant, what says the doctor to my water?" And the page answers, "He said, sir, the water was a good healthy water; but for the party that owned it, he might have more diseases than he knew for"[2]—a diagnosis, in view of this patient's checkered and promiscuous career, that was probably quite possible even after no more thorough an examination than simply casting the wise eye on the urinal. Urinary examination had, too, in these days, an importance not now recognized; an importance, as a test of past life, reflected in a painting of this time by the appearance—much to the disgust of the female concerned and of her irate father—of a human embryo in the urinal; and by the Latin saying of the day: "Vulva dolet, urina docet."

Steen and his colleagues did not overlook the quack. You find Steen representing him, in some of his most characteristic but not his most finished paintings, as a rather low order of being, exhibiting his wares or his skill in the open air. He often has a heavily-sealed diploma in prominent display—preferably written in Hebrew; and the crowd which has gathered to hear and to see him gives the artist a splendid chance to exhibit his skill in painting the bizarre Dutch types which appear in these pictures in such profusion (pictures 2 and 3). The same subject attracted Gerard Dou, who, without missing any of Steen's detail, attained a finish that the latter apparently deemed the theme unworthy of. To see, however, how the quack may be treated adequately and yet with exquisite elegance, one must turn to Hogarth's well-known picture in the "Marriage" series of the London National Gallery.

There is a splendid portrait of a quack by Franz Hals, the younger, in the museum at Rotterdam, in which the operator is pictured as removing a small tumor from a patient's forehead; and this removal of glands, or sebaceous cysts, from various portions of the head and neck is a subject not overlooked by Steen. (Picture 4 represents the treatment, and picture 5 the dressing, of such a case.) These pictures reflect a popular belief of the time; for there was a common saying in Holland in the sixteenth and seventeenth centuries which

[1] Merry Wives of Windsor, Act II, Scene III.
[2] Henry IV, Part 2, Act I, Scene II.

FIG. 4.—The Operator (not listed in Smith)—Boijmans Museum, Rotterdam.

FIG. 5.—The Operator (listed in Smith's Supplement, No. 16, as The Village Doctor)—Royal Museum at Brussels. Subject: Removal of a plaster from patient's neck.

FIG. 6.—The Dentist—Hague Gallery. (A similar picture is listed in Smith's Catalogue Raisonné as belonging to the Collection Lormier.)

FIG. 7.—Love-sick Lady (Smith, 119)—Collection Steengracht, The Hague.

FIG. 8.—The Visit of the Physician (known also as Liebestoll)—The Imperial Ermitage, St. Petersburg.

FIG. 9.—The Sick Lady (Smith Supplement, No. 8)—Now in Rijks Museum at Amsterdam, originally in the Collection Vanderhoop. Woman in silver-grey silk jacket with ermine border; skirt of yellow silk.

FIG. 10.—Sick Lady (Smith, No. 146)—Alte Pinakothek, Munich. Woman in scarlet velvet jacket with ermine border; skirt of bluish-gray silk.

FIG. 11.—Doctor Feeling Lady's Pulse (Smith, No. 114)—Now in the Mauritshuis, The Hague; restored thither from the Louvre in 1815. Woman in blue jacket with ermine border; skirt of

ran: "He has a stone in his head," and the meaning of which was, "The patient is crack-brained." "Cutting the stones from one's head" was therefore supposed to be curative for mental deficiency. The saying, which originated from the romance of King Arthur, was of common occurrence in the farces of the time; and it is little wonder that this reflection of it is to be found in the canvases of Steen.

The dentist, too, was not without his interest for this school. He is the subject of one of Steen's rather good groups (picture 6); of a curious outdoor scene by Victors; of a typical but uncanny interior by van Ostade, and of one of Dou's wonderful candle-light scenes; but these pictures throw no particular light on the medicine of the time.

What light, on the other hand, do the pictures of Steen and his school throw on the *physician* of those days—on the physician as a man, on his standing in the social, his place in the intellectual, life of the times? He is surely, I think we may answer first of all, no longer a barber. He has become a gentleman and his profession is now, whether respected or not, at least respectable. He may indeed be, as we have seen, a wise-looking crier in the markets, with his Hebrew diplomas and all the vulgarity of a peddler; or he may even be a coarse reprobate leading his vulgar life within the pale of legitimate practice (pictures 7 and 8). But he is neither always nor characteristically these. He is on the contrary a courtly, mild-mannered, well-dressed gentleman. He moves about the sick-room with grace. He has none too many scientific resources; but though he has little to depend upon beyond the finger on the pulse and a glance at the urine, he has made himself a place, among his patients, of honor, of dependence, and of affection. Medicine is, in a word, finding in him for its service a good type of man.

Steen, it is true, with all his interest in the medical profession, did not gloss over defects he saw in its professors; yet I think Holländer, who insists that "Steen sought to make the physician laughable wherever he could," rather overdoes the matter. Such a picture for instance as the Amsterdam "Die Kranke Frau" is surely not open to any such criticism. We know, indeed, how bitter satire against the physician could at this time be; vulgar, far from subtle and often tasteless pictures were drawn ridiculing him in every phase of his work; and it is to my mind striking that Steen, with his keen eye, and his shameless humor, did not make the physician more ridiculous. Unlike the satire of Molière, which was directed chiefly at the physician, that of Steen was very much concerned with the patient; if it struck the doctor at all it was only with an incidental, glancing stroke. In his frequent pictures of love-sick ladies his bitter laugh is for the ladies themselves; for the physician there is either no laugh at all or else a good-natured smile. It is indeed, for a painter of such coarse possibilities, a rather fine type of man which Steen in his best moods has recorded as practicing medicine in these times.

If we go to Gerard Dou we find the same testimony. Titian, with his magnificent Parma physician, and Holbein, with his equally splendid Chamber's portrait, had indeed already shown us what type of man medicine *could* appeal to. The message of the Dutch painters on this point is that as a matter of fact, and on the average, medicine in the seventeenth century *did* appeal to men whose intellects, manners, and bearing are worth study.

A list of the medical pictures by Jan Steen, with their numbers, according to Smith's "Catalogue Raisonné" follows:

1.	The Dentist	No. 8
2.	" Water Doctor	" 37
3.	" Quack	" 46
4.	" "	" 47
5.	" Village Surgeon	" 68
6.	" Sick Lady	" 75
7.	" " "	" 77
8.	" " "	" 114
9.	Love-sick Lady	" 118
10.	" "	" 119
11.	" "	" 120
12.	Sick Lady	" 144
13.	" "	" 146
14.	Doctor dressing Leg	" 170
15.	Love-sick Lady	Supplement to Smith " 4
16.	" "	" " " " 6
17.	" "	" " " " 7
18.	Sick Lady	" " " " 8
19.	Love-sick Lady	" " " " 9
20.	Doctor attending Lady, *enceinte*	" " " " 10
21.	Love-sick Lady	" " " " 11
22.	Sick Lady	" " " " 12
23.	Love-sick Lady	" " " " 13
24.	" "	" " " " 14
25.	Village Doctor	" " " " 16
26.	Village Surgeon	" " " " 41
27.	Doctor feeling Pulse	" " " " 88
28.	Mountebank	" " " " 101

Pictures by Steen not certainly identified in Smith's "Catalogue":

29.	Der Wunderdoktor	Rijks Museum, Amsterdam.
30.	Der Operateur	Boijmans Museum, Rotterdam.

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CAMP LIFE: ITS SPHERE OF USEFULNESS AND ITS BENEFICIAL EFFECTS ON GROWING BOYS.

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Throughout the entire United States, summer camps are being formed and thousands of boys spend their vacations in the woods. That this sort of life is beneficial has never been doubted, yet I can find in the literature no scientific reports as to the benefits of this camp life. Also, there are but few popular articles which detail the proper supervision and hygienic surroundings of such camps, and if, as the writer hopes, these camps are to continue to increase in number, there should be more attention paid to their management by the medical profession. As is readly appreciated, the fullest benefits of such out-door life can be secured only if the best hygienic conditions and thoughtful care surround the campers. If several leading camps would report scientific studies of the physical condition and improvement of the boys while under observation, and would outline the daily routine which was found to be most practical in managing the camps, it would undoubtedly greatly aid other camp directors. It is only through such co-operation that hospitals and sanitaria have gained their present degree of efficiency and perfection, and, indeed, to this same cause may be traced the rapid progress in all sciences. So also in camps there should be this "survival of the fittest." Yet the only means at the present time whereby a camp director may ascertain what has been found to be best is by personal inspection, which is in many ways difficult and at times impossible. There should be no more jealousy or secrecy in the methods used in managing boys while camping, than in the treatment of cases in hospitals. During the summer of 1907, I accepted the position of physician-in-charge of "Camp Champlain," Mallets Bay, Vermont, and during the months of July and August closely studied the boys under my care. The results of these examinations are herewith published in order to show the marked benefits of this out-door life, and a rather detailed account of the camp and its management is given in the hope that it may be of value to those interested in the supervision of camps.

Location.—The camp, which has been in existence for thirteen years, is located on a high rocky point covered with pines and surrounded by the waters of Mallets Bay. From one side of this point the water of the bay was pumped through a two-inch iron pipe to the mess hall. The opening of this pipe was about fifteen feet below the level of the bay and perhaps ten feet above the solid rock bottom. There was, I believe, no opportunity for pollution of this supply as all kitchen drainage was emptied into a sand filter on the opposite side of the point. All residue from this filter, and the accumulations of the toilet rooms, which were located at quite a distance from the camp proper, were removed twice weekly to a farm more than half a mile distant. Carbolic acid and chloride of lime were used in large quantities to insure proper disinfection. That the water supply for drinking and for cooking purposes is in no way affected, I am assured, for the two bacteriological examinations of the supply were most convincing.

Camp management.—The campers, about fifty in number, were quartered in twenty-two army tents placed on raised platforms, and as will be seen in the following routine, these tents were inspected each day in order to insure cleanliness and to teach self-reliance. A strict military discipline was maintained, each member of the camp staff, ten in all, acting consecutively as "officer-of-the-day." This officer had entire charge of the camp during his régime, and to him was delegated the duties of inspection and general supervision. The order of the day was:

7.00 a. m. Reveille. All boys were compelled to arise promptly, take a morning "dip," air blankets and sheets, and dress.

7.15 a. m. Bugle again blown and officer sees that orders have been obeyed.

7.25 a. m. Bugler sounds first call for breakfast. Boys assemble on the veranda of the large wooden mess hall, and await second summons.

7.30 a. m. Call for breakfast sounded. Boys go to their places and await signal by the officer-of-the-day to be seated. Any absence or lateness is noted and investigated. No boy may leave the mess hall before thirty minutes have expired. This regulation also holds for dinner and supper.

8.30 a. m. Bugle blown for those doing summer study. Perhaps one-third of the campers prepare for college examinations, or are tutored to absolve conditions. All other boys are allowed to boat, fish, or take part in games. During the mornings the two physical directors coach the junior, intermediate, and senior baseball teams. Track work, tennis, and walking are also encouraged.

11.30 a. m. Fifteen minutes' swim. Supervised by the physical directors, officer-of-the-day and camp physician. All of the younger boys are given swimming lessons, and medals are given later in the season to those showing the greatest improvement at the time of the athletic meet. Any boy who, in the judgment of the physician, is physically disqualified from such energetic exercise or who becomes quickly chilled by the water is allowed only the morning "dip," which consists merely in a quick dive and rapid rub. Several boys who were below the average weight for their age were allowed only the afternoon swim.

12.15 p. m. Bugle is blown for inspection of tents. Beds must be in order, clothing arranged properly, floors swept, and no paper must be under or around the tents.

12.25 p. m. First call for dinner. The same general order maintains at dinner and supper.

12.30 p. m. Second call for dinner.

3.30 p. m. **Second fifteen-minute swim. Precautions as at first swim are observed.**
6.25 p. m. **Bugler sounds first call for supper.**
6.30 p. m. **Second call is sounded.**
7.30 p. m. **Bugle recalls to shore all juniors on the lake.**
9.00 p. m. **Taps for juniors.**
10.00 p. m. **Taps for seniors. Officer-of-the-day inspects each tent and assures himself that each boy is in bed and that all lights are out. He must also count the boats and at eleven o'clock must again ascertain that no camper is out of his tent.**

At first glance it might appear that a day so regulated might be irksome to the boys and that these regulations would be difficult to enforce. That the boys do enjoy this military discipline has been definitely proved by the success of the camp, and by the general feeling of good-fellowship and cheerfulness. Such regularity is in itself an excellent training, and the campers are much benefited by the regular hours for sleeping.

Should occasion arise to discipline a boy there are various punishments which prove most salutary. For instance, when the camp first opens there is apt to be lateness at meals, or perhaps the tents are disorderly, or a boy may attempt to swim at other than "lawful hours." Such an offender is forbidden to boat or to swim for a stated time. Usually two days on dry land is very effective.

Also the query may arise as to how in a camp of so many boys there is not a great infraction of the swimming regulations. That these rules have not been broken is due to two factors. First, the smaller boys are not allowed in boats outside of a chain of islands, all of which are in hailing distance of "Slab Sides," a house built over the water's edge, at which all swimming takes place. Hence these boys do not have any opportunity to take extra swims because one of the camp staff is constantly on duty at this "watch tower," and while primarily he is there to see that the younger boys are always safe, yet at all times he could also make sure that there was no infraction of the swimming rules. The larger boys have a two-mile range of the lake, but word is quickly brought by the campers around the shore of any infraction of rules. Second, the fact that the boys are taught special dives and new strokes in swimming, as well as their love for sport, makes them desire to swim with the rest of the boys. So if a camper be forbidden to swim, he must have rare good luck to get a plunge unnoticed, and he must do so alone, because the spring-boards and good-fellowship of "Slab Sides" tend to keep the campers together.

Beneficial effects of camp life.—As soon as possible after the boys entered camp, a thorough physical examination of each was made and aside from the statistics given later, some interesting facts were noted. About one-half of the campers could not intelligently answer as to the regularity of their bowels. They had no definite time each day for movements, kept but little record as to the frequency or number of these movements, and seemed to consider the whole matter as of little importance. Close questioning revealed many cases where two or three days intervened between passages. Fourteen depended upon cathartics almost entirely, allowing two days or more to pass before considering a movement essential. The headaches, stomach disorders and general malaise to which these boys were subject were in no manner traceable, in their opinions, to any lack of regularty. The dangers and many unpleasant, as well as serious, complications arising from such heedlessness were emphasized, and in the more stubborn cases a careful record was made. It is needless to state that in a few weeks these boys were having regular movements, and that the patent cathartics were no longer necessary.

Yet these boys were of excellent parentage, had physicians of good standing and hence should have learned regular habits at a much earlier time. It certainly seems most culpable in parents to allow their chldren to grow up in ignorance of such important matters, and no matter how proficient or painstaking the family physician may be, he can not always be in attendance nor can he make sure that his instructions are carried out. One instance may serve to recall vast numbers of similar cases. A boy feels unwell, the doctor investigates and decides that the trouble is due to constipation. A purge is given, and the patient is warned about being careful and regular. After, say, five weeks, there is a recurrence of the symptoms and the cause is similar. Now the camp physician holds a unique position. He gives advice and can, by close daily questioning and by constant repetition, finally enforce regularity.

The "method of dining" also occasioned surprise. During the first three days after camp opened, the boys hurriedly bolted their food and rushed back to their boats or games. It really seemed mostly a matter of speed. They had to eat because they were hungry, and they spent as little time as possible in the mess hall. It was then that the thirty-minute rule was enforced. At first there was grumbling because after ten or fifteen minutes the boys were compelled to sit before empty plates and await dismissal. After a short time, however, the boys became more philosophic and ate slowly.

Smoking was prohibited in all cases except amongst boys who had written permission from their parents. What smoking there was, had to be confined to the tents, hence the hero worship which is so frequently found among boys of varying ages tempted none of the younger ones to begin the habit.

Tea and coffee were never given, and at first this appeared to be a hardship. It seems strange that boys ranging from eleven to seventeen years of age should be so fond of these stimulants, and passing strange that they should be allowed several cups of each daily while in their own homes. Whether they will return to these habits after the two-months' abstinence is hard to say. Be that as it may it is certainly a good thing to have them discontinue the use of tea and coffee for even so short a time.

Most of these campers had been living the artificial, unhealthy life of the city, with late evenings spent at theatres or in study, and with comparatively little out-door exercise. Consequently a certain percentage showed at the time of examination a decided anaemia. In order to ascertain the rapid recuperative effects of fresh air, regular hours and

STATISTICAL RECORD OF THE PHYSICAL EXAMINATION OF THE CAMPERS.

Case.	Noted Below.	Date of Examinations.	Age.	Weight in Lbs.	Height in Cms.	Chest Expanded.	Chest Contracted.	Heart.	Lungs.	Urine. Specific Gravity.	Urine. Color.	Urine. Reaction.	Urine. Albumen.	Urine. Sugar.	Blood. Haemoglobin; Sahli.	Blood. Number of Red Cells per cmm.	Blood. Number of White Cells per cmm.
1	.....	July 3	11	72	146¼	70	63½	N	N	1017	c. p. y.	ac	Trace	0	81	4,180,000	4 960
		Aug. 24		**77**	**147**	**71**	**62½**	**N**	**N**	**1015**	**c. p. y.**	**ac**	**0**	**0**	**94**	**4,684,000**	**4 170**
2	.....	July 3	11	63¾	145¾	67½	62	N	N	1019	c. y.	ac	0	0	92	4,900,000	6,710
		Aug. 24		**67**	**146**	**70½**	**60½**	**N**	**N**	**1018**	**c. p. y.**	**ac**	**0**	**0**	**98**	**5,200,000**	**7 180**
3	X	July 3	11	64	136	65½	59	N	N	1022	c. o.	ac	Trace	0	84	4,160,000	8,440
		Aug. 24		**66½**	**137¼**	**66**	**57**	**N**	**N**	**1014**	**c. p. y.**	**ac**	**0**	**0**	**97**	**4,896,000**	**7,670**
4	X	July 7	11	55½	131¼	65	59½	N	N	1018	c. p. y.	ac	0	0	62	4,240,000	6,400
		Aug. 26		**54½**	**131½**	**64½**	**57½**	**N**	**N**	**1014**	**c. y.**	**ac**	**0**	**0**	**91**	**4,694,000**	**5,800**
5	.....	July 5	12	63½	139⅛	65¼	61½	N	N	1016	c. y.	ac	0	0	98	5,100,000	3,880
		Aug. 25		**67**	**139½**	**69**	**62**	**N**	**N**	**1013**	**c. p. y.**	**ac**	**0**	**0**	**94**	**4,880,000**	**8 860**
6	X	July 9	12	67¼	132	72	67	N	X	1024	c. o.	ac	Trace	0	103	5,040,000	7,800
		Aug. 26		**68½**	**136½**	**73**	**65½**	**N**	.....	**1013**	**c. y.**	**ac**	**0**	**0**	**92**	**4,485,000**	**6,940**
7	X	July 2	12	67¾	135	69	62¼	N	N	1026	c. o.	ac	Trace	0	85	4,850,000	7,560
		Aug. 25		**68½**	**135½**	**68½**	**61⅜**	**N**	**N**	**1019**	**c. y.**	**ac**	**0**	**0**	**91**	**4,944,000**	**6,280**
8	.....	July 7	12	53¾	130	67½	60½	N	N	1020	c. p. y.	ac	0	0	82	4,276,000	8,120
		Aug. 23		**58**	**132**	**68½**	**61½**	**N**	**N**	**1014**	**c. p. y.**	**ac**	**0**	**0**	**88**	**4,678,000**	**7 270**
9	X	July 5	12	91	156½	77	69½	N	N	1016	c. p. y.	ac	0	0	93	5,020,000	9,230
		Aug. 24		**92½**	**156½**	**78**	**68**	**N**	**N**	**1012**	**c. y.**	**ac**	**0**	**0**	**96**	**5,060,000**	**8 980**
10	X	July 8	12	68½	143	69½	62½	N	N	1014	c. p. y.	ac	0	0	76	4,184,000	8,170
		Aug. 25		**73¾**	**143½**	**71½**	**64**	**N**	**N**	**1016**	**c. p. y.**	**ac**	**0**	**0**	**87**	**4,712,000**	**8 210**
11	X	July 7	12	65	148	69	61½	N	N	1017	c. p. y.	ac	Trace	0	81	4,220,000	7,760
		Aug. 24		**69½**	**149¾**	**69½**	**60**	**N**	**N**	**1015**	**c. y.**	**ac**	**0**	**0**	**92**	**4,680,000**	**7,250**
12	X	July 3	13	84	149	74	69½	X	N	1012	c. p. y.	ac	0	0	76	3,988,000	8,120
		Aug. 21		**87½**	**149½**	**75½**	**68**	**X**	**N**	**1017**	**c. p. y.**	**ac**	**0**	**0**	**88**	**4,984,000**	**6,780**
13	X	July 8	13	64	142½	68	61½	N	N	1021	c. p. y.	ac	0	0	71	4,122,000	7,890
		Aug. 23		**68¾**	**143**	**69½**	**60½**	**N**	**N**	**1015**	**c. p. y.**	**ac**	**0**	**0**	**88**	**4,896,000**	**7,080**
14	.....	July 8	13	67½	143¼	72½	66	N	N	1018	c. p. y.	ac	0	0	90	4,298,000	6,500
		Aug. 23		**78**	**144**	**75½**	**67**	**N**	**N**	**1014**	**c. y.**	**ac**	**0**	**0**	**93**	**4,800,000**	**7,890**
15	X	July 9	13	67	154½	69½	63½	N	N	1019	c. p. y.	ac	0	0	82	4,253,000	8,120
		Aug. 23		**74**	**155**	**71**	**62½**	**N**	**N**	**1017**	**c. p. y.**	**ac**	**0**	**0**	**86**	**4,968,000**	**7,840**
16	X	July 1	13	108	169	80¼	74½	N	N	1012	c. p. y.	ac	Trace	0	98	4,960,000	8,430
		Aug. 18		**111½**	**169½**	**82**	**74**	**N**	**N**	**1016**	**cl.**	**ac**	**0**	**0**	**101**	**5,020,000**	**7,980**
17	X	July 1	13	92¾	155	78½	74½	N	N	1021	c. p. y.	ac	0	0	84	4,464,000	5,840
		Aug. 18		**97½**	**155¾**	**80½**	**73**	**N**	**N**	**1018**	**c. y.**	**ac**	**0**	**0**	**98**	**5,126,000**	**6,000**
18	.....	July 2	13	104	162	74	69	N	N	1015	c. y.	ac	0	0	65	4,002,000	8,880
		Aug. 25		**115**	**163½**	**77**	**68**	**N**	**N**	**1017**	**c. y.**	**ac**	**0**	**0**	**92**	**4,898,000**	**8,120**
19	.....	July 2	14	107	160¼	81½	76½	N	N	1022	c. o.	ac	0	0	104	5,132,000	6,760
		Aug. 26		**115¼**	**165**	**86¼**	**75½**	**N**	**N**	**1020**	**c. o.**	**ac**	**0**	**0**	**101**	**5,060,000**	**7,580**
20	.....	July 1	14	97¼	154½	77½	72½	N	N	1018	c. y.	ac	0	0	98	5,100,000	8,220
		Aug. 22		**102½**	**155¾**	**80½**	**71**	**N**	**N**	**1015**	**c. p. y.**	**ac**	**0**	**0**	**103**	**5,132,000**	**7,840**
21	X	July 2	14	97½	151	80½	72	N	N	1021	cl. o.	ac	Trace	0	81	4,890,000	7,210
		Aug. 23		**110**	**151¾**	**85**	**76**	**N**	**N**	**1012**	**c. o.**	**ac**	**0**	**0**	**93**	**4,927,000**	**9,210**
22	.....	July 4	14	90½	157½	78½	71	N	N	1017	c. y.	ac	0	0	96	5,420,000	5,980
		Aug. 22		**93¾**	**158½**	**80¾**	**69½**	**N**	**N**	**1015**	**c. p. y.**	**ac**	**0**	**0**	**92**	**5,120,000**	**6,499**
23	X	July 8	14	104½	151½	78¾	73	N	N	1020	c. p. y.	ac	0	0	102	5,110,000	4,850
		Aug. 26		**100**	**153¼**	**82**	**70½**	**N**	**N**	**1019**	**cl. y.**	**ac**	**0**	**0**	**105**	**5,046,000**	**7,180**
24	.....	July 6	14	102	142	74	69½	N	N	1015	c. p. y.	ac	0	0	67	4,460,000	11,400
		Aug. 26		**113**	**142½**	**78**	**68¾**	**N**	**N**	**1017**	**c. p. y.**	**ac**	**0**	**0**	**94**	**4,998,000**	**5,860**
25	.....	July 9	15	129	175¾	86	77	N	N	1016	c. p. y.	ac	0	0	97	4,946,000	6,600
		Aug. 22		**135½**	**177**	**89**	**78½**	**N**	**N**	**1014**	**c. p. y.**	**ac**	**0**	**0**	**99**	**4,890,000**	**7,120**
26	X	July 5	15	122½	168½	81½	76	N	N	1013	c. p. y.	ac	Trace	0	72	4,140,000	8,450
		Aug. 22		**126½**	**169½**	**82**	**75½**	**N**	**N**	**1018**	**c. p. y.**	**ac**	**Trace**	**0**	**98**	**4,640,000**	**4,550**
27	.....	July 7	15	97¼	158½	80¼	75	N	N	1020	c. p. y.	ac	0	0	87	4,898,000	4,670
		Aug. 19		**106½**	**158¼**	**82**	**74½**	**N**	**N**	**1014**	**c. p. y.**	**ac**	**0**	**0**	**94**	**4,776,000**	**5,170**
28	.....	July 9	15	90	162	75¾	69	N	N	1024	c. o.	ac	0	0	67	4,320,000	7,870
		Aug. 19		**103**	**163**	**79½**	**68½**	**N**	**N**	**1017**	**c. p. y.**	**ac**	**0**	**0**	**88**	**4,674,000**	**6,320**
29	.....	July 5	15	123⅜	169	89	77½	N	N	1015	c. p. y.	ac	0	0	96	4,896,000	8,930
		Aug. 20		**127**	**171**	**90¼**	**77**	**N**	**N**	**1015**	**c. p. y.**	**ac**	**0**	**0**	**99**	**4,998,000**	**7,610**
30	X	July 6	16	115½	163½	83	73	N	N	1003	c. p. y.	ac	0	0	86	5,020,000	9,110
		Aug. 20		**116**	**164¼**	**85¼**	**74**	**N**	**N**	**1010**	**c. y.**	**ac**	**0**	**0**	**101**	**5,141,000**	**8 200**
31	X	July 6	16	140	173	95¼	85½	N	N	1018	c. o.	ac	0	0	94	4,640,000	7,770
		Aug. 1		**141**	**173**	**96½**	**84**	**N**	**N**	**1016**	**c. o.**	**ac**	**0**	**0**	**97**	**4,554,000**	**8 180**
32	X	July 4	16	107¾	159	78½	74⅓	N	N	1020	c. o.	ac	X	0	100	5,122,000	6,760
		Aug. 21		**114**	**160½**	**80**	**72**	**N**	**N**	**1014**	**c. y.**	**ac**	**0**	**0**	**97**	**5,001,000**	**7,900**
33	.....	July 7	16	117	165¼	84½	79	N	N	1015	c. p. y.	ac	0	0	94	4,424,000	5,680
		Aug. 21		**118½**	**166**	**86½**	**78**	**N**	**N**	**1013**	**c. p. y.**	**ac**	**0**	**0**	**102**	**5,017,000**	**5,260**
34	X	July 6	17	106	166¾	81	72⅝	X	N	1034	colorless	ac	0	X	87	3,998,000	8,320
	X	Died															
35	.....	July 1	17	132	167¾	90½	82	N	N	1020	c. y.	ac	0	0	97	5,080,000	9,230
		Aug. 21		**140**	**169¾**	**92**	**83**	**N**	**N**	**1017**	**c. o.**	**ac**	**0**	**0**	**94**	**4,890,000**	**7,550**
36	.....	July 4	17	113	173¾	85	79	N	N	1023	c. o.	ac	Trace	0	71	4,774,000	6,310
		Aug. 20		**119**	**174½**	**89**	**79½**	**N**	**N**	**1014**	**c. y.**	**ac**	**0**	**0**	**92**	**4,908,000**	**6,040**
37	X	July 2	17	137	175	87	81¼	N	N	1019	c. p. y.	ac	0	0	110	5,142,000	4,830
		Aug. 21		**138½**	**175½**	**89**	**78½**	**N**	**N**	**1019**	**c. p. y.**	**ac**	**0**	**0**	**97**	**4,983,000**	**6,980**
38	.....	July 8	17	133	169½	88	79½	N	N	1016	c. y.	ac	0	0	94	5,231,000	9,120
		Aug. 26		**136½**	**169¾**	**90½**	**79½**	**N**	**N**	**1012**	**c. p. y.**	**ac**	**0**	**0**	**103**	**5,070,000**	**6,100**
39	X	July 1	18	113¼	168½	81	75½	N	N	1018	c. o.	ac	0	0	69	4,130,000	14 000
		Aug. 18		**119½**	**169**	**84½**	**77**	**N**	**N**	**1020**	**c. p. y.**	**ac**	**0**	**0**	**96**	**5,311,000**	**5,880**
40	.....	July 4	18	109½	165	83	77½	N	N	1022	c. y.	ac	0	0	83	4,273,000	8,350
		Aug. 19		**117**	**165½**	**85**	**78⅝**	**N**	**N**	**1017**	**cl. y.**	**ac**	**0**	**0**	**95**	**4,899,000**	**7,640**
41	.....	July 4	19	112⅜	163	86	77½	N	N	1020	c. y.	ac	0	0	87	5,002,000	9,370
		Aug. 19		**113½**	**164¼**	**87**	**75½**	**N**	**N**	**1019**	**c. p. y.**	**ac**	**0**	**0**	**91**	**4,864,000**	**5,730**
42	.....	July 2	20	160	171¾	96	87½	N	N	1015	c. p. y.	ac	0	0	82	4,373,000	6,930
		Aug. 18		**158**	**172**	**97**	**87**	**N**	**N**	**1017**	**c. p. y.**	**ac**	**0**	**0**	**96**	**4,990,000**	**8,150**
43	.....	July 8	21	163	181½	87	83	N	N	1014	c. p. y.	ac	0	0	78	4,140,000	8,300
		Aug. 26		**165**	**181¾**	**88**	**83½**	**N**	**N**	**1018**	**c. p. y.**	**ac**	**0**	**0**	**93**	**4,833,000**	**7,760**

Light-faced type indicates the record at the first examination; heavy-faced type denotes results of second examination. N, negative; X, something abnormal which is discussed below; c., clear; cl., cloudy; p., pale; y., yellow; o., orange.

wholesome food, no drugs were administered for this condition. Certain of the more anaemic boys were advised to eat raw or soft-boiled eggs and to drink large quantities of milk. In fact milk figured most extensively in the menu of each meal, from sixty to seventy-five quarts being consumed a day.

The record of a few of the campers is not given since they came for too short a time. In measuring and weighing the boys, I was greatly aided by Mr. Charles W. Mayser, of the Montclair Academy, N. J., who was formerly athletic instructor at Yale, and whom I wish to thank for his assistance. The haemoglobin tests were made with the Sahli instrument. Just before the second examinations, certain of the boys had within a day or two completed a 250-mile tramp through the Adirondacks, and others had taken part in an athletic meet. Hence the weights and blood tests were probably somewhat lowered.

Discussion of Cases.

Weight and height.—These statistics are self explanatory. That the boys should have gained so markedly, when one considers the rowing, swimming, walking, racing, tennis and field athletics, is somewhat remarkable. That they gained in strength is easily believable, and I noted that their muscles were firmer and that the "student stoop" had disappeared from several who were studiously inclined. Next year it is hoped that a standard strength test will be taken of each boy.

Chest expansion and contraction.—In this list there is shown a decided development not only in the greater ability to expand, but also in the increased power to contract the chest wall. All of these measurements were made on the nipple line.

Heart and lungs.—There was only one serious heart case in camp, and this had been previously diagnosed and was under treatment. This boy (case 12) had mitral insufficiency following rheumatism, and had to be most carefully watched. He gained somewhat in weight, and to a certain extent in haemoglobin, and returned home in much better condition. Case 34 is also noted (X), but this will be taken up later. Case 6 exhibited definite signs of emphysema, and had a tuberculous history.

Urine.—All boys were advised to drink large quantities of milk and water, and to this I ascribe the lowered specific gravity and the disappearance, in all except one case (26), of the traces of albumen (1, 3, 7, 11, 16, 21). This albuminuria was, of course, the transitory albuminuria of adolescence, and no casts were found microscopically. The cloudiness in the noted cases (16, 23, 40) was due to phosphates and urates.

Sugar was found in one instance and to this I particularly wish to call attention. This boy, whose various weights and measurements are tabulated under case 34, came to camp outwardly in good health. He was not in the best of spirits nor did he take great interest in athletics or studies. This, however, his friends said had been his condition for at least a year. Upon examining the urine a most decided reaction was given with both Fehling's and Nylander's reagents. His father was straightway notified and a specimen of urine was sent to Dr. B. H. Stone, of the Burlington (Vt.) State Board of Health, for verification. Eight per cent of sugar was found. The urine was colorless, syrupy, and very sticky. The patient upon being questioned gave a history of frequent and copious micturition, great thirst, ravenous appetite, and a general feeling of depression. All of these symptoms had lasted for more than one year. His heart was rapid and irregular at times. The patient was put on a diabetic diet, but no change was noted in the percentage of sugar until July 20, when there was a lessened output of sugar but the presence of a large amount of albumen. On July 21, fifteen days after the first examination, he felt unwell. At 2 a. m., July 22, he suffered the first suppression of urine, was catheterized, carried immediately to a Burlington hospital, arrived in a comatose condition, and died at 7.30 the same evening.

What I wish to emphasize is by no means novel. Every growing boy, and for that matter every adult, should have a thorough physical examination at least once a year. The dental profession has at last persuaded the public that seasons of toothache are not the only times when the dentist is necessary, and there is no more reason why organic disturbances should be allowed to manifest themselves before the physician is notified than why a tooth should be left until its ache proves its pathological condition.

Blood examination.—Many of the boys were anaemic as before stated (cases 3, 4, 7, 10, 11, 13, 17, 21, 26, 30, 39) and a diet of eggs and milk was prescribed. A glance at the statistical record will show the marked improvement in these cases. The leucocytosis in case 34 was due to an infected foot.

Summary.—In reviewing this record one cannot fail to see the great improvement in the condition of the boys, and it is the hope of the writer that this brief article will stimulate the growth of summer camps, and their more careful supervision by the medical profession.

STUDIES IN GENITO-URINARY SURGERY

THE JOHNS HOPKINS HOSPITAL REPORTS, Volumes XIII and XIV, now ready. Volume XIII consists of about 605 pages with 201 figures in the text, six plates and one colored chart.

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NOTES ON NEW BOOKS.

Atlas of Cutaneous Morbid Histology. Consisting of fifty-three colored figures on twenty-four plates and text. By Dr. Max Joseph and J. B. Van Deventer. (*Chicago: W. T. Keener & Co., Publishers, 1906.*)

In this Atlas there are represented highly colored drawings by Dr. Van Deventer of the morbid histology of 48 skin diseases, of which 16 are rare diseases. Representations of many common diseases are left out entirely, e. g., eczema. The only drawings of syphilitic lesions are lichen syphiliticus and glossitis gummosa, the latter being a very uncommon manifestation of the disease. The common varieties of syphilis are not represented at all. Since there are so many drawings of rare diseases and none at all of many common diseases the Atlas is not very useful to students or practitioners of medicine.

To the dermatologist the Atlas will be useful, but many of the drawings are to be criticized, as they do not represent well what is actually seen in the sections. Dr. Van Deventer has not drawn what such a good authority as Max Joseph has seen in the sections. In many of the lesions the disease is of an acute, inflammatory nature, yet no polynuclear leucocytes are seen in the drawing. An example of this is seen in Plate II—Acne Urticata. The drawings are often good impressionist pictures, but the details are very poor, whereas what is wanted in miscropical drawings is especially good detail. Take one example in the Atlas, viz., the drawing representing the morbid histology of Herpes Zoster, Plate VIII, page 16; it has not the least likeness to what is actually seen in sections of this disease. Compare this drawing with the colored drawings of Kopytowski in the Archiv. für Dermat., Vol. 54, page 18, where the histological pictures are correct.

The carcinoma primarium section is drawn fairly well, but that of c. secundarium is badly represented. The drawing of the section from follicles is not very good, and there does not appear to be any cellular infiltration into the corium in the drawing of leukoplakia buccalis.

The drawings which can be said to be very good are those of angiokeratoma, erythema exudatorium multiforme, variola, glossitis gummosa, molluscum contagiosum, ichthyosis hystrix (the blood vessel in the corium ought not to be left open at each end), pityriasis rosea, lichen r. planus and verrucosa, lichen syphil. lymphangioma simplex, lupus erythemat., and vulgaris, mycosis fungoides, purpura, tubercul. cutis verrucosa, ulcus durum, verruca vulgaris, and xanthoma diabet.

The descriptions by Max Joseph, an eminent dermatologist, are given in a succinct and clear manner.

Elementary Manual of Regional Topographical Dermatology. By R. Sabouraud. Translated by C. F. Marshall. (*New York: Rebman Co., 1906.*)

When a practitioner or student is confronted with a case of skin disease, and has not had an extensive training in this branch of medicine, he finds great difficulty, even with a good text-book beside him, in diagnosing the case because he does not know what portion of the text-book to consult. Sabouraud's work attempts to obviate this difficulty.

The classification of skin diseases in the large majority of text-books on dermatology is based on a pathological plan which was originally Hebra's idea. A few text-books have been written where the diseases have been arranged alphabetically. Sabouraud's idea is an original one as far as text-books are concerned, but the plan has been in practical use in the Johns Hopkins Medical School for the last eight years, where there have been supplied to the students typewritten notes, wherein the common skin diseases have been arranged regionally and also according to their primary lesion.

In Sabouraud's text-book, which consists of 660 pages and is fairly well illustrated, the various regions of the skin are taken in order, beginning with the face, and a list of common and rare diseases is given first, then a description follows of each affection. The rare diseases are mixed with the common, which the writer thinks is a mistake.

The description of the common diseases is very incomplete and much too short. This plan of division involves a great deal of repetition of the same disease in many chapters scattered throughout the book. It would have been better and more practical to simply give a list only of the diseases in the different areas and then later consider the diseases fully and properly. The treatment is usually limited to a few remedies for each disease and the modern methods are mentioned as far as X-rays, and high frequency currents are concerned, but there is no reference to opsonic treatment.

No pathology is given and the etiology is often dismissed in a few words and is sometimes not very reliable. Yet with all these faults the text-book is a good one; it shows individuality, and although the descriptions of the diseases are short, they are to the point and are practical. It is valuable if only for the lists of skin diseases which attack the different regions of the body. The illustrations are fair when one compares them with the excellent reproductions in some of the larger American text-books.

Schleif's Materia Medica and Therapeutics. A Pocket Text-Book of Materia Medica, Therapeutics, Prescription Writing, Medical Latin and Medical Pharmacy. By William Schleif, Ph. G., M.D., University of Pennsylvania, Philadelphia. New (3d) edition, 12mo. 470 pages. (*Philadelphia and New York: Lea Brothers & Co., 1907.*)

The present volume presents the subjects of materia medica and therapeutics in the usual way and appears to be quite complete in the number of remedies discussed. Many of the newer synthetic compounds are included.

As is necessary in a "pocket-book," the treatment of the subject matter is very concise. In fact, we believe that the paragraphs, particularly those devoted to the physiological action of the various drugs, are much too brief—so brief, indeed, as to interfere with the author's statement in the preface that the book "contains . . . the essential knowledge required in the most complete college courses on Materia Medica and Therapeutics." For those preparing for State board examinations, for example, who wish quickly to review the main facts in regard to the various drugs, the volume is admirable, but for undergraduates it seems unsuitable as a text-book. The teaching is too dogmatic and the discussions, as a rule, too abbreviated.

The Essentials of Histology, Descriptive and Practical. For the use of Students. By C. A. Schäfer, LL. D., Sc. D., F. R. S., etc. (*Philadelphia and New York: Lea Brothers & Co., 1907.*)

The seventh edition of Schäfer's Essentials of Histology presents a neat appearance, is strongly bound, and is printed upon good paper in clear type.

The subject matter is divided into fifty chapters or "lessons," for conveniently accompanying the work of a class. As a preface to each lesson, are given practical directions for the preparation and study of the tissues described in the text of the ensuing lesson. The text presents in clear descriptions the essentials of histology, omitting less important details. The illustrations are profuse and

accurate, being selected largely from other authors. The coloring of some of the illustrations is a new feature of this edition. The colored illustrations often give the student a better idea of what he should see in the stained section. Much has been added to the chapters on the nervous system. Many of Cajal's original drawings are reproduced in these chapters.

An appendix explains the principal methods of preserving, hardening, embedding, cutting, and staining tissues.

A Text-Book of Diseases of Women. By J. CLARENCE WEBSTER, B. A., M. D. Edin., F. R. C. P. E., F. S. S. E., etc. (*Philadelphia and London: W. B. Saunders Company, 1907.*)

The author of this text-book is to be commended for the successful treatment of a subject, which he recognizes as consisting of more than merely the pelvic organs of women. This broad treatment of the subject characterizes the book throughout, and imbues one with confidence in a specialist who teaches not only the greatest sympathy with every phase of the patient's being, but recognizes as well the minor as the major methods of the specialty. The student or general practitioner who turns to this book for advice and instruction will find comfort in the simplicity as well as directness of the handling of the subject matter contained therein.

Its practical application has lost nothing by the scientific basis upon which the book is written, and the scientinc views are up to the present day, and embodied in such form as to be of practical use.

It covers the field of gynæcology, as the general practitioner is likely to see it, and treats the subject in such a way that he will be able to use it. The author is conservative without being narrow, and progressive without being extreme.

The book is well gotten up; the paper, binding, and typography are excellent, the illustrations, though not as elaborate as are found in some of the recent text-books, fulfill the purpose for which they are intended.

The Principles and Practice of Dermatology. By WILLIAM ALLEN PUSEY, A. M., M. D., etc. (*New York and London: D. Appleton & Company, 1907.*)

Revised editions of old works and new books on skin diseases brought out during the past five years have placed the text-books on dermatology at a very high plane. The latest of these is Pusey's Principles and Practice of Dermatology. This compares favorably with its predecessors and is a standard work.

Considerable attention is given to the principles of dermatology and the writer has offered many new ideas. Under general pathology some very good illustrations are used to make clear the origin of diseased conditions. The discussion of treatment in general is very good and many formulæ are given which, however, are not written in any uniform system. More thought has been bestowed on classification than the result seems to be worth; three new classes of disease being added without in any degree clearing the situation.

The amount of work done is well attested by the numerous references given under each disease. A sufficient amount of space is furnished to each disease to give a good idea of its clinical and pathological appearance, but the differential diagnosis could be made more comprehensive. Special treatment is one of the best features of the book. For a worker who has had so much experience in electro-therapeutics, it is refreshing to see with how much conservatism the author regards the value of the X-rays.

The work is fully illustrated with 356 illustrations. Quite a number of these, however, are not of much value, because they do not show sufficient detail to give one an idea of what they are intended to represent. We are glad to see only one colored plate. As a rule these are of such indifferent coloring and poor execution as to be worse than useless.

The binding of cloth is hardly strong enough to support the weight of the book, but the paper and printing are both good.

Deutsches Bäderbuch. Quarto, civ. + 536 pp. and 13 plates. (*Leipzig: Weber, 1907.*)

This important work is published under the auspices of the German Imperial Health Office and is designed to give an unbiased account of the leading German baths, mineral waters, and "Luftkurorte." Authoritative analyses of about 650 springs are given; with these is given much information concerning the climate, rainfall, etc., which will be of great value to anyone contemplating a visit to one of these springs.

There is a series of introductory chapters which make the work of very general interest to physicians, i. e., aside from any special reference to the German springs. Probably no better summaries of the present status of our knowledge concerning the pharmacology and general therapeutic uses of hot, cold, and carbon dioxide baths, and of the various kinds of mineral waters are to be found than in the chapters contributed by Jacobi (of Göttingen) and F. Kraus (of Berlin). The radioactivity of the springs is briefly discussed from both the chemical and clinical standpoint. Other introductory chapters treat of geology, climatology, and practical considerations concerning the construction of baths, etc.

This is probably the most comprehensive work ever published on the baths and springs of any country; it will be a valuable addition to medical and other libraries.

A Manual of Hygiene and Sanitation. By SENECA EGBERT, M. D., Professor of Hygiene in the Medico-Chirurgical College, Philadelphia. New (fourth) edition, thoroughly revised. 12mo., 498 pages, with 93 illustrations. (*Philadelphia and New York: Lea Brothers & Co., 1907.*)

In his preface the author says: "The Science of Hygiene has become so extensive that many volumes might be devoted to the discussion of its principles and the details of their application. Consequently the author will be content if the book continues to serve its purpose as a simple 'manual.'" With this limitation in view Dr. Egbert has succeeded in writing an excellent manual, well balanced, well arranged, and up-to-date. It is an entirely satisfactory work for a student's first course in hygiene. Most persons fail to appreciate the full meaning of the word hygiene, which, as Parks says, "signifies rules for the perfect culture of mind and body," and this makes clear why it is impossible to treat the entire subject in a single volume. Hygiene and sanitation are almost synonymous terms and to show the difficulty of treating this branch of medicine in small compass I again quote from the author, p. 282: "The essence of sanitation is to secure perfect health, to increase the inherent power, to resist noxious and harmful influences, and to make all the surroundings and environments of the body pure and free from depressing factors." Dr. Egbert has divided his work into 15 chapters as follows: Introduction, bacteriology, the atmosphere-air, ventilation and heating, water, food, stimulants and beverages, personal hygiene, school hygiene, disinfection, quarantine, the removal and disposal of sewage, military hygiene, vital statistics, and the examination of air, water, and food. Each chapter is concise and clear, and the work is written so as to be interesting. A few misprints have been noticed, clearly due to the enlarging of the text, and the failure to make the references on a given page agree with the new paging (ex. p. 170, 8 lines from bottom for 213 read 220; p. 176, 2d paragraph 6th line for 165 read 169; there are similar errors on pp. 271 and 308). R. N.

Immune Sera. By DR. CHARLES FREDERICK BOLDUAN. Second edition, rewritten. (*New York: John Wiley & Sons.*)

This work is a revision of the author's translation of Wassermann's monograph published in 1904, and in addition to the excel-

lent material of the first edition contains new chapters on snake venoms, agglutinins, opsonins, and serum sickness. In the discussion of opsonins the author takes the conservative stand held by most American investigators, and in the chapter on serum sickness he gives a report of Gay and Southard's recent studies on Anaphylaxis. The new portion of the book reaches the same high standard as the original. The material is well chosen, the style is simple—a matter of no little importance in such a condensed work—and on the whole the book is an excellent exposition of the most essential facts and theories bearing on the field of immunity.

The Diseases of the Eye. By G. E. de Schweinitz, A. M., M. D. 5th edition revised. (*Philadelphia and London: W. B. Saunders Company, 1906.*)

This splendid work is a revision of four former editions with so much more added as to bring it abreast with modern medicine.

The work is divided into twelve chapters, each chapter taking up and considering in a concise but not too brief manner a single subject. These subjects are first considered in a general way so as to develop the subdivisions, then the subdivisions are taken up and minutely discussed. No single chapter can be selected as the best, they are all the product of a finished authorship and the work of an exceptional ophthalmologist.

In revising the older editions the author has re-written many of the chapters so as to make them conform to modern ideas; he has also added many paragraphs on subjects not considered in the older works.

The most delightful part of the book is that no space is wasted on unproved theories. Where a subject is still under dispute both sides of the controversy are succinctly given; where the weight of the author's experience forces him to lean in one direction he frankly states his views without dragging in a long line of useless argument.

The index, occupying, as it does, fifty pages, is one of the most valuable parts. It is possible to find any subject or subdivision of any subject without trouble.

This work is certainly one of the best text-books on ophthalmology extant and probably the best by an American author.

Röntgen Rays and Electro-Therapeutics. By M. K. Kassabian, M. D. (*Philadelphia and London: J. B. Lippincott & Co., 1907.*)

As the title indicates, the author has endeavored to cover the field of electricity and its allied branches as applied to medicine. The first section of the book is devoted to electro-therapeutics and in it the author describes the various forms of medical electrical apparatus and methods of application.

The second section is devoted to Röntgen Rays. This section is a more important one. The author has devoted 450 of the 550 pages of the book to this subject which is well handled and attractively presented.

The chapters on apparatus and dosage deserve more than passing notice. The various forms of X-ray apparatus are not only described, but the principles are explained so that one gets an intelligent understanding of the actual working of the various parts. The chapter on X-ray dosage is especially valuable.

Unfortunately so far no one has been able to elaborate a standard unit of dosage and consequently there are many methods of treatment in vogue. The author has taken great pains to collect and summarize these various methods. Thus we are able to get in a glance what would otherwise cause the reader to search through many books and monographs. The numerous and excellent illustrations add greatly to the value of the book.

Elements of Human Physiology. By Ernest H. Starling, M. D. London, F. R. C. P., F. R. S. Eighth edition. (*Chicago: W. T. Keener & Co., 1907.*)

According to the preface, the author's aim in this work is "to present in the shortest possible compass the essentials of the Science of Physiology." This, the eighth edition of this text-book, is considerably larger than any of the previous editions and comprises slightly over seven hundred pages. The first chapter is an "Introduction" of twenty-four pages and is concerned with a short account of physiological processes, such as assimilation, respiration, circulation, co-ordination, reaction, and reproduction, viewed in a general biological sense. Following this is a chapter upon the chemistry of the body, and then the more special physiological processes are treated in the usual order and grouping.

The book as a whole is excellent, and is written in the clear concise style of the author. The terseness of expression is in many places very attractive, as for example in the first paragraph of the chapter upon Lymph and Tissue Fluids (p. 286): "The blood flows in capillaries with definite walls consisting of a single layer of cells, and is thus separated from the tissue elements. . . . A middleman is thus needed between the blood and the tissues, and this middleman is the lymph . . . ." In other instances it is with the sacrifice of absolute accuracy, as for example in the chapter on the Ductless Glands, "Under this title have been grouped a number of organs, the sole resemblance between which lies in the fact that we know very little about them" (p. 513).

In a work of this scope, which treats of such a broad subject as physiology, it is extremely difficult to present the salient features of a subject and avoid a lengthy presentation of different views. A certain amount of positiveness of statement no doubt is useful to avoid confusing the elementary student. Nevertheless, the main adverse criticism that can be applied to this text-book is in certain subjects a tendency to regard undecided questions as settled and to leave the student with one idea concerning them. In one instance at least the conclusion is rather surprising. "It seems therefore highly probable that the normal reflex or voluntary contraction is not a tetanus (a condition which is a product of the physiological laboratory), but a prolonged single contraction caused by a constant stimulus arriving at the muscle from the central nervous system" (p. 148). The author sheds no new light upon this old question. He gives the sequence of contraction in the mammalian heart to be respectively great veins, auricles, ventricles (p. 210), and states that the contraction of the muscular rings at the mouths of the great veins always precedes the auricular systole and prevents regurgitation of the blood into the veins when the auricle contracts (p. 211). He regards the neurogenic theory of the heart-beat as a dead issue (p. 237). He states that reflection from the periphery cannot explain the production of the dicrotic waves (p. 230), and gives the old objection, that no matter from what portion of the arterial tree the tracing is made, the dicrotic notch always occupies the same place on the pulse wave. This disposes of a theory which has not been seriously entertained for a long time, but it leaves out entirely the very important view held by v. Kries and others, that the dicrotic wave is due to a double reflection.

In view of the present importance of the venous pulse and its constantly increasing occurrence in medical literature, it is rather surprising that no reference is made to it.

No references to the literature are given. Individual authors are, however, frequently referred to by name. Even in a work of this scope it would seem useful to the student, for the purpose of collateral reading, to have a few references to carefully selected articles of fundamental importance.

This edition of Prof. Starling's work places before the medical student a text-book well fitted for his needs. The situation in regard to carefully written, concise, and yet somewhat comprehensive physiological text-books for English reading medical

students has been greatly improved in the last few years by the publication of one or two excellent works, to which this book, in its present form, is a worthy addition. Remarkably good chapters are those upon Digestion and Secretion, and Metabolism. The latter especially is a clear, concise presentation of the salient features in a remarkably brief compass, and fulfills well the desire of the author as expressed in the preface.

J. A. E. EYSTER.

The Diseases of the Digestive System. Edited by FRANK BILLINGS, M. D. Authorized translation under supervision of JULIUS L. SALINGER, M. D. (*New York and London: D. Appleton & Company, 1906.*)

This is a collection of monographs by German authors which appeared as Vol. V of Die Deutsche Klinik. As these articles originally appeared during the years 1901-5, the material cannot be said to be absolutely new and is familiar to those who have followed the publications appearing as Die Deutsche Klinik. Each individual writer treats of the subject with which he is most familiar and in which, as a rule, he has done pioneer work. The book, therefore, gives one an insight into the very best work which has been done in diseases of the digestive system. Such a plan of having text-books written by several authors seems to be a necessary result of the present high grade of specialization in medicine, and so long as the writers are the leading exponents of the subjects on which they write, as in this case, no objection can be raised to the method, and much may be said in favor of it. In the present instance the list of writers includes such men as Rosenheim, Riegel, Ewald, Boas, Oser, Minkowski, Vierordt.

Not only are diseases of the stomach and intestines thoroughly treated, but a splendid article on diseases of the pancreas by Oser is included, and diseases of the liver and gall stones are exhaustively considered. Probably the least satisfactory section of the book, from the standpoint of the American physician and surgeon, is the one on acute diffuse peritonitis, appendicitis, and perityphlitis. One notes with interest what a straining there is to give rules for the differential diagnosis of the various forms of appendicular inflammation. It is admitted, however, that "*exceptions to all these rules occur and in all directions.*" The writer begs the question as to operative procedure, and finally concludes that in the individual case one must be largely influenced by the skill of the attending surgeon and the confidence one has in his ability.

An interesting chapter is contributed by Strasburger on the examination of the feces.

The translation has been well done, the typographical work is excellent and altogether it is a most attractive book. The editor has contented himself with seeing that the views of the writers are faithfully reproduced and has not added to or modified the text to any important extent. Very few references are given, some are omitted which were given in the original publication. It does not pretend to be a reference book, however, but a work for the guidance of those treating disease, and for that reason is a most valuable book for the general practitioner.

Practice of Obstetrics by American Authors. Edited by CHARLES JEWETT, M. D., Professor of Obstetrics and Gynecology in the Long Island College Hospital, New York. Third edition. Revised and enlarged. (*New York and Philadelphia: Lea Brothers & Co., 1907.*)

The list of contributors to this volume includes, among others, such well known teachers as Dickinson, Edgar, Henrotin, Jewett, Robb, Webster, and Williams. This selection of itself is strongly commendatory of the book and would give it an unusual value were it not that these men either have their own individual text-books, or have contributed largely to other treatises on obstetrics. Therefore, in many parts the present work is practically a reprint of sections in contemporary text-books.

The illustrations are almost entirely adopted from other publications. Bumm's excellent drawings have been freely used and likewise the admirable diagrams of Faraboeuf and Varnier. For these credit is frankly given.

That part of the book which deals with obstetrical anatomy and pathology is notably deficient in microscopical considerations, both with regard to text and illustration. Those pictures which have been inserted are sometimes inaccurate; thus in one of the colored plates (XIV) several of the chorionic villi are designated blood sinuses. Too scant attention is given to the implantation of the ovum, the formation of the membranes, and the development of the placenta. While, on the other hand, more space is allotted to embryology than would seem necessary to the study or practice of Obstetrics.

The clinical side of parturition and the care of the mother and child in the post partum period are adequately and clearly treated. It is to be regretted that advice is still given to apply an abdominal binder immediately after the completion of labor. Experience has shown that its use is not of any benefit to the patient and may do considerable harm, since backward displacements of the uterus are more commonly observed in cases where the binder has been used.

Autointoxication during pregnancy is dealt with in a confused manner. All manifestations of such a state are considered to be dependent upon the same organic changes, and designated, "The Toxæmias of Pregnancy." This is surprising, since Stone, who writes this section, was one of the first to call attention to the liver changes in pernicious vomiting and their similarity to acute yellow atrophy, which is quite different from the liver condition of eclampsia.

The chapters on obstetric surgery catalogue very completely the various operations which aim at delivery. It is not in accord with present opinion, however, to concede eleven pages to symphysiotomy and merely give passing mention to pubiotomy. The latter has proven itself a valuable addition to operative obstetrics supplying the advantages gained by cutting through the symphysis, without the immediate and remote complications which frequently attend this procedure.

The Quarterly Journal of Medicine. Edited by WILLIAM OSLER, J. ROSE BRADFORD, A. E. GAUNOD, R. HUTCHISON, H. D. ROLLESTON, and W. HALE WHITE, with the help of T. CLIFFORD ALLBUTT, BYRON BRAMWELL, and others. Vol. I. Number 1. (*Oxford: At the Clarendon Press. London, New York,* and *Toronto: Henry Frowde, October, 1907.*)

This new English journal is the official organ of the lately formed Association of Physicians of Great Britain and Ireland. It "will be devoted to the publication of original papers dealing with Clinical Medicine . . . It will include critical reviews on special subjects and diseases, but with this exception the journal will be entirely concerned with original communications." Such are the objects of the journal as stated in the advertising sheet. The multiplication of medical journals is not to be generally advocated—there are already far too many, but there would seem to be a place for such a journal as this, especially in England, where no quarterly covering the same ground already exists. This number contains 13 papers, all well worth reading. The journal is abundantly and well illustrated, some of the reproductions being in color. If the editors are able to publish each quarter a number with articles of as much interest as those presented, the journal cannot fail to be a success and will be welcomed not only by the profession in England but in Europe and America as well. It is to be hoped that it will meet with the support it deserves, for the present number could hardly be improved upon in the quality and variety of its contributions.

The journal is of a pleasing size and type, altogether dignified and worthy of the Clarendon Press.

R. N.

Progressive Medicine, Vol. III, September, 1907. A Quarterly Digest of Advances, Discoveries and Improvements in the Medical and Surgical Sciences. Edited by HOBART AMORY HARE, M. D., Professor of Therapeutics and Materia Medica in the Jefferson Medical College of Philadelphia. Octavo, 290 pages, with 15 engravings. (*Philadelphia and New York: Lea Brother & Co., Publishers.*)

In this volume the diseases of the thorax and its viscera, including the heart, lungs, and blood-vessels, have been discussed by Dr. W. Ewart; dermatology and syphilis by Dr. W. S. Gottheil; obstetrics by Dr. E. P. Davis, and diseases of the nervous system by Dr. W. G. Spiller. Each of these contributors is a recognized leader in his own specialty, so that their remarks on the progress made in these branches of medicine are well worth reading and serious thought. By securing the services of such men, the editors of this series have been able to issue quarterly volumes of distinct value to the general practitioner who has not the means or the time to keep up with the most important contributions to medicine, which appear all over the world in a variety of languages. For this reason "Progressive Medicine" can be recommended to the medical profession at large as a most serviceable handbook. Each volume contains a few illustrations, and is furnished with a good index. R. N.

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